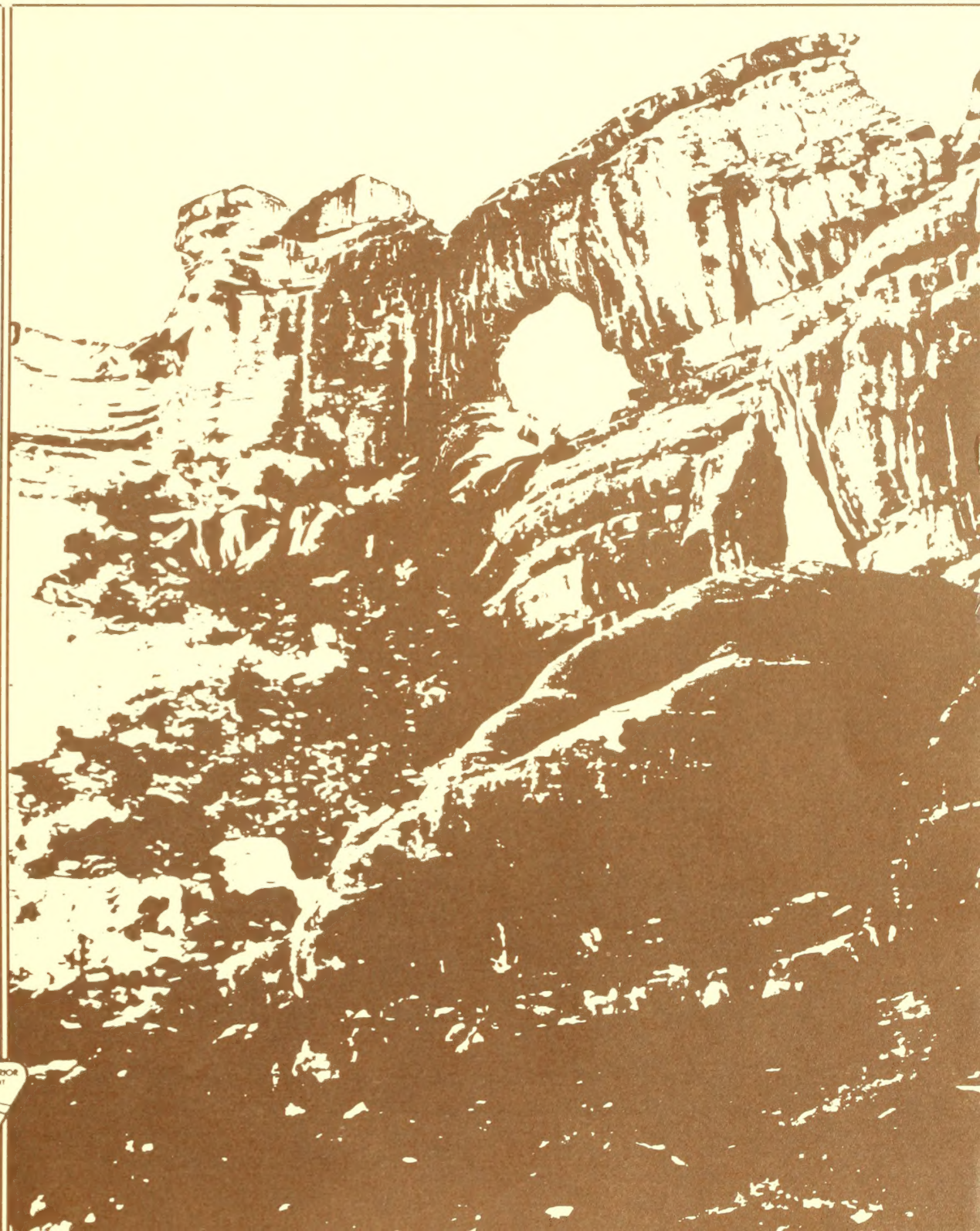
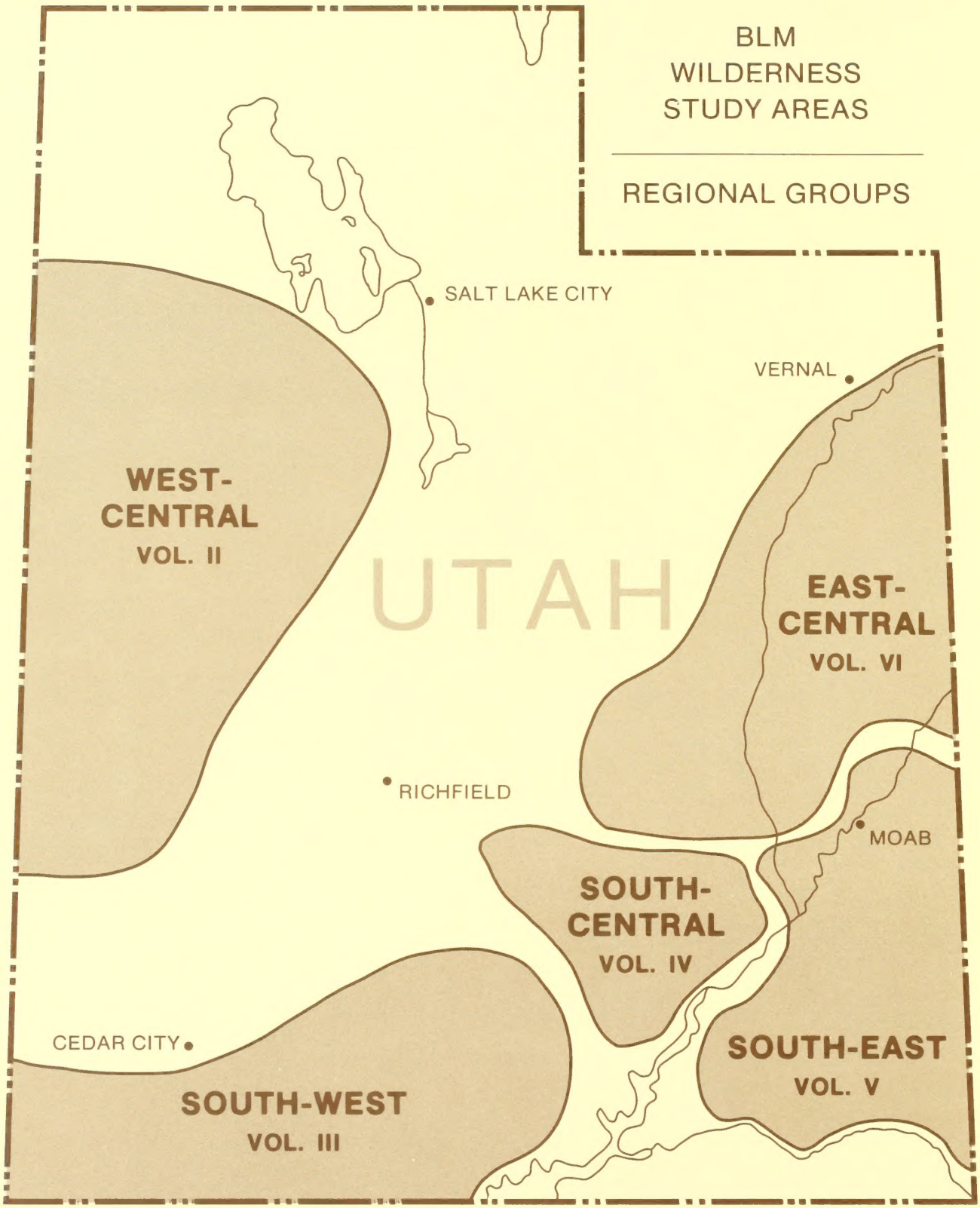
Utah BLM Statewide Wilderness Draft Environmental Impact Statement

Volume V South-East Region



U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
March 1



This is **Volume V** of a six volume set. Volume I is the statewide overview. It contains the Glossary and Appendices for all volumes. Volumes II-VI contain analyses for individual Wilderness Study Areas.

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Volume V South-East Region

Mancos Mesa WSA

Grand Gulch ISA Complex

Road Canyon WSA

Fish Creek Canyon WSA

Mule Canyon WSA

Cheesebox Canyon WSA

Dark Canyon ISA Complex

Butler Wash WSA

Bridger Jack Mesa WSA

Indian Creek WSA

Behind the Rocks WSA

Mill Creek Canyon WSA

Negro Bill Canyon WSA

Horseshoe Canyon (North) WSA

Lost Spring Canyon WSA

BLM Library
D-553A, Building 50
Denver Federal Center
P. O. Box 25047
Denver, CO 80225-0047

Mancos Mesa WSA

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D-553A, Building 50
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MANCOS MESA WSA
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MANCOS MESA WSA
(UT-060-181)

INTRODUCTION

General Description of the Area

The Mancos Mesa Wilderness Study Area (WSA) is located in western San Juan County, about 50 miles west of Blanding. It is bounded on the west and north by Glen Canyon National Recreation Area (NRA); on the east by the rim of Red Canyon; and on the south by the rim of Moki Canyon. The WSA is about 13 miles long (north to south) and up to about 12 miles across (east to west). The WSA contains 51,440 acres of BLM-administered land.

The Mancos Mesa WSA is characterized by extremely rugged topographic features. The mesa is over 6,000 feet in elevation in the southeast, sloping down westward to an elevation of about 4,800 feet along the boundary of the Glen Canyon NRA. Canyon bottoms are down to 4,200 feet in elevation. The rim of Red Canyon forms the east border of the WSA. The northern and western WSA boundaries coincide with the Glen Canyon NRA boundary. The rim of Moki Canyon (600 to 800 feet deep) forms the southern boundary.

Three major canyons and small segments of two canyons form the major topographic features of the WSA. The canyons are rugged, winding, and steep-walled. North Gulch (450 to 800 feet deep) starts near the center of the unit and extends southwest for 8 miles to the Glen Canyon NRA boundary. Cedar Canyon starts near the eastern edge of the WSA and extends northwest for 12 miles to the northwest corner, where it enters the Glen Canyon NRA. In the upper portions of Cedar Canyon there are many side canyons, forming a dissected area about 4 miles long east to west by 2 miles across. In the north of the WSA a major side canyon of Cedar Canyon (called Mancos Canyon locally) parallels the unit boundary for 8 miles, 250 to 450 feet deep. Wind-blown sand covers large parts of the mesa top, and large deposits occur in places in the canyons where it has blown in from above. Blackbrush is the most common vegetation in the WSA.

The WSA is adjacent to the National Park Services' (NPS) recommended 41,700acre Moki-Mancos Mesa wilderness (as proposed for Glen Canyon NRA).

Information on the climate of the Mancos Mesa WSA is based on the nearest weather station at Natural Bridges National Monument. The next nearest weather station is 50 air miles to the east at Blanding. The average annual temperature at Bridges is 51 degrees Farenheit (F), with an average low of 30 degrees F and an average high of 65 degrees F. The record low is -2 degrees F, and the record high is 101 degrees F. Annual precipitation ranges from about 8 to 12 inches.

Specific Issues Identified in Scoping

General issues pertaining to the wilderness study are discussed in Volume I. Specific issues pertaining to the Mancos Mesa WSA identified through formal public scoping are as follows.

1. *Comment:* Post-FLPMA (Federal Land Policy and Management Act) oil and gas exploration has impaired a portion of the WSA; this degradation is now being used to recommend that portion unsuitable for wilderness designation.

   Response: Oil and gas exploration has had little effect on the wilderness values in the WSA. During 1976 to 1979, road building activities occurred in a portion of the WSA in connection with existing mining claims and uranium exploration. These activities are further discussed in the Affected Environment section and in the analysis of the Partial Wilderness Alternative.

2. *Comment:* This WSA is located roughly on-trend with existing oil and gas production to the southeast. This production is from the

Pennsylvanian Hermosa Group, which is subdivided into the Pinkerton Trail, Paradox, and Honaker Trail Formations. Oil and gas production appears to be related to a carbonate shelf environment which has interbedded algal mounds and organic shales. The apparent source rock-reservoir relationship in the Mancos Mesa area, however, is not supported by chemical analysis for total organic carbon.

Response: Despite favorable stratigraphy in the WSA, structural factors suggest that any accumulations of oil and gas would be small.

3. *Comment:* This WSA is also prospective for carbon dioxide in the Permian Cedar Mesa and Mississippian Leadville Formations. While carbon dioxide in itself is not a fuel resource, it is used extensively in enhanced oil recovery systems.

Response: In a BLM review of available information, including existing well data, no indication of carbon dioxide was found in the immediate area of the WSA. Carbon dioxide does occur about 60 miles northwest from Mancos Mesa.

4. *Comment:* BLM determined wilderness values were high and post-FLPMA mineral exploration was nonimpairing; therefore, the area must be recommended suitable.

Response: During scoping for this Environmental Impact Statement (EIS), BLM presented a preliminary indication of areas considered suitable or unsuitable for wilderness designation. The indication of suitability was made public prior to the EIS to obtain further input which has assisted in the formulation of the EIS alternatives. Additional input is expected as a result of the public review and comment on the Draft EIS. At the conclusion of the EIS process, BLM will review and consider all of the information received and at that time will formulate a final recommendation of areas found suitable for wilderness designation. Rationale for such recommendations will be included in a Wilderness Study Report to be submitted to the Secretary of the Interior and, subsequently, to Congress. The rationale will be keyed to the criteria of the "Wilderness Study Policy" (USDI, BLM, 1982) and to other resource management factors generally as described in Chapter 2, Volume I of this EIS.

5. *Comment:* The WSA boundaries are grossly wrong. To the south it is a full day's hike to the boundary from any major intrusion. The boundary in Red Canyon is .50 mile up the cliff and leaves out much natural area. The north wall of Moki Canyon is included, but the south wall is not. Large, natural, and controversial areas that contain mining claims (some of which are owned by county commissioners) were excluded.

Response: The boundaries of the Mancos Mesa WSA were originally established during the inventory phase of the study process. These boundaries were adjusted to the current configuration in accordance with a review by the Interior Board of Land Appeals (IBLA).

6. *Comment:* Apparently the BLM allowed roads to be constructed in an area where rehabilitation was not possible. As a result, 5,320 acres were dropped for lack of naturalness. This violates Section 603 of FLPMA and should not be used to eliminate any acreage from consideration.

Response: Refer to the responses to the preceding two comments.

7. *Comment:* The important opportunities for wilderness recreation present are indicated by the BLM proposal to create a primitive area in much of the present WSA.

Response: The opportunities for wilderness recreation are discussed in this document. There is no BLM proposal to create a primitive area in Mancos Mesa, although the potential for such a designation was recognized in the South San Juan Management Framework Plan (MFP) (USDI, BLM, 1971b).

8. *Comment:* The oil and gas potential of the WSA is ranked low by Science Applications, Inc. (SAI, 1982). Based on proprietary information, representatives of the oil and gas industry believe the potential of the WSA to be moderate to high. This information should be considered in the Draft EIS.

Response: At this time BLM has not made an independent assessment of geologic information gathered by oil and gas companies. The SAI (1982) report will be used as the reference on oil and gas potential for this EIS, but information provided by the oil and gas industry and available mineral investigation reports by the USDI, Geological Survey and Bureau of Mines will be reviewed by BLM prior to making final wilderness recommendations to the Secretary of the Interior.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated from Detailed Study

No alternatives were considered for this WSA other than those analyzed.

Alternatives Analyzed

Three alternatives are analyzed for this WSA: (1) No Action; (2) All Wilderness (51,440 acres); and (3) Partial Wilderness (46,120 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

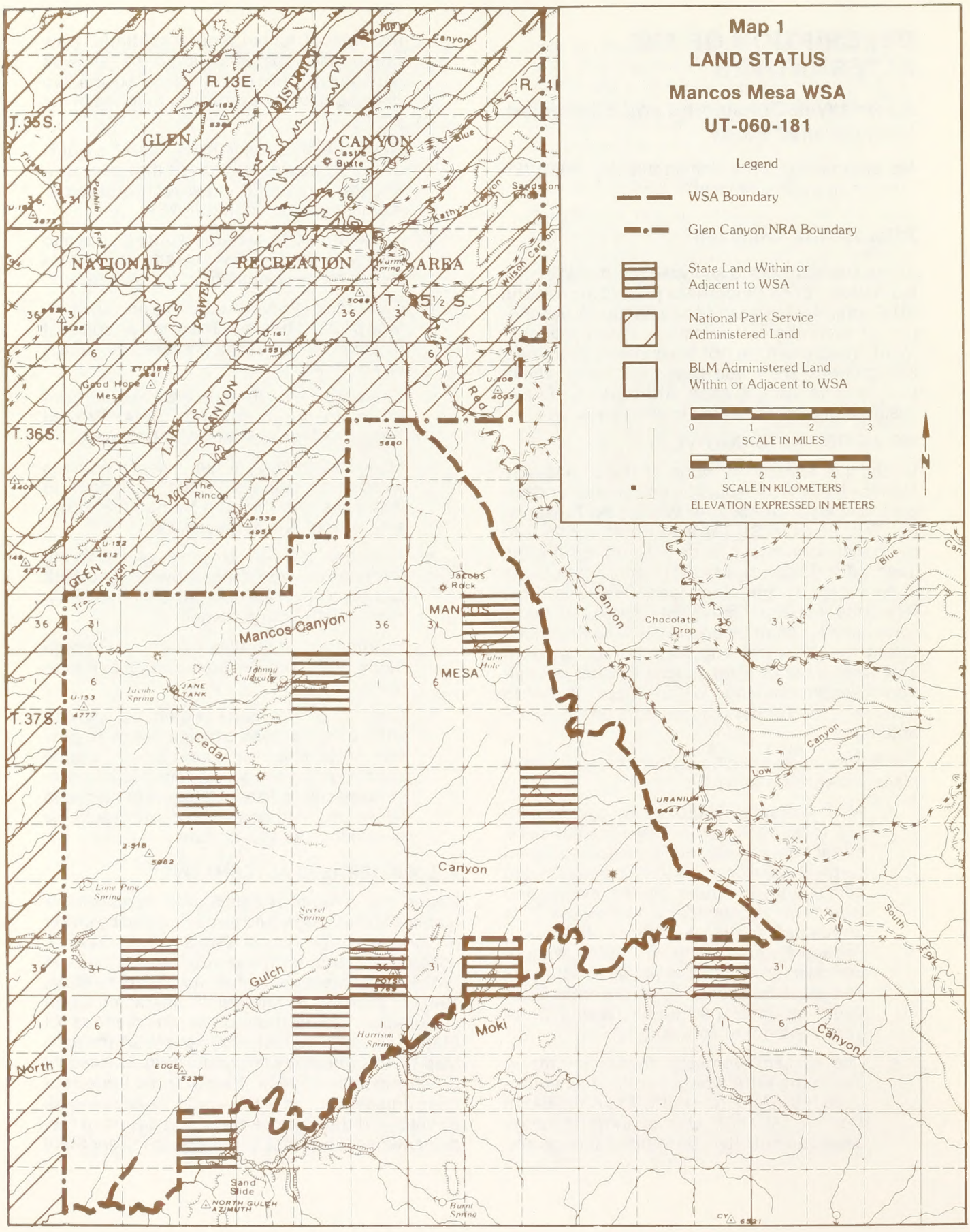
Under this alternative, none of the 51,440-acre Mancos Mesa WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the South San Juan MFP (USDI, BLM, 1971) until that plan is superseded by the San Juan Resource Area Resource Management Plan (RMP) currently scheduled for completion in 1986. The State land within the WSA (refer to Map 1) has not been identified in the MFP for special Federal acquisition through exchange or purchase. (Refer to Volume I for further information on State inholdings.)

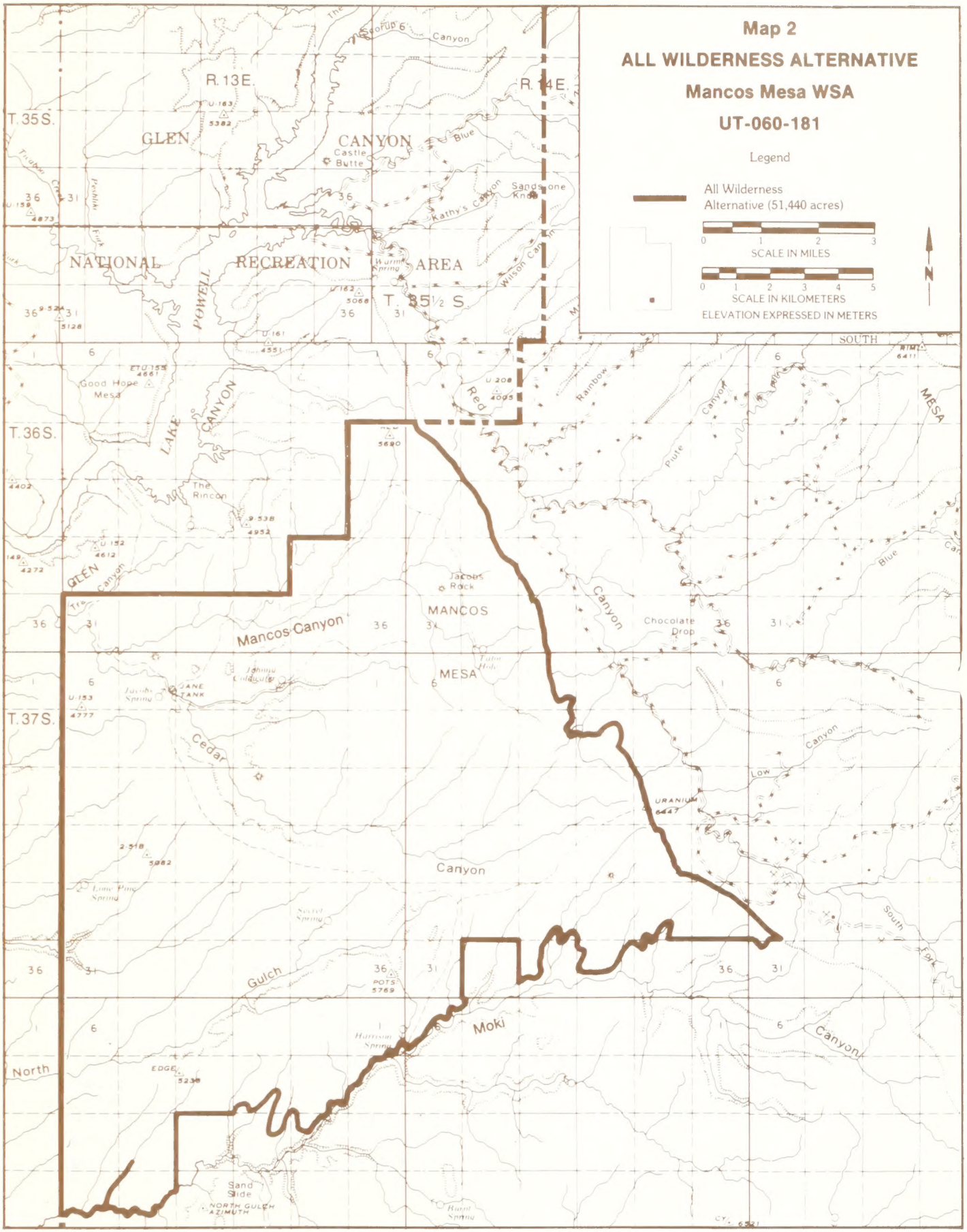
The following are specific actions that would take place under this alternative:

- All 51,440 acres would remain open to mineral location and sale. Development work, extraction, and patenting would be allowed on the 2,438 existing mining claims (35,840 acres) and on future mining claims and would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809), without concern for wilderness values. Existing oil and gas leases which cover the entire WSA could be developed under leasing Category 1 (standard stipulations).
- The present domestic livestock grazing use in the WSA would continue as authorized in the MFP (currently 514 Animal Unit Months [AUMs]). Use of existing range developments (two developed springs and 660 feet of fence) would continue. New range developments would be allowed without wilderness considerations. No developments are currently planned in the WSA.
- Developments for wildlife, water resources, etc., could be allowed if in conformance with the MFP; however, no developments are planned in the WSA.
- The entire WSA acreage would be open to off-road vehicle (ORV) use and new access routes for development could be allowed.
- The entire WSA would be open to woodland product harvest. There is no harvest of forest products at the present time, nor is any planned.
- The entire 51,440-acre WSA would continue to be managed under Visual Resource Management (VRM) Class II.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

ALL WILDERNESS ALTERNATIVE

Under this alternative, all 51,440 acres of the Mancos Mesa WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. Upon designation, acquisition of seven sections of State land (4,482 acres) within the WSA (refer to Map 1) would be likely and could be authorized by purchases or exchange. Two of three State sections adjacent to the WSA would be exchanged. Should land transfers be made, it is assumed that management and types of impacts to former State


Map 1
LAND STATUS
Mancos Mesa WSA
UT-060-181
Legend
WSA Boundary
Glen Canyon NRA Boundary
State Land Within or Adjacent to WSA
National Park Service Administered Land
BLM Administered Land Within or Adjacent to WSA
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
R. 13E.
R. 14
T. 35 S.
T. 35½ S.
T. 36 S.
T. 37 S.
GLEN CANYON NATIONAL RECREATION AREA
GLEN CANYON DISTRICT
POWELL
LAKE
Good Hope Mesa
The Rincon
Mancos Canyon
MANCOS MESA
Jacobs Rock
Chocolate Drop
Johnny Calculator
JANE TANK
Jacobs Spring
Cedar Canyon
Lime Pine Spring
Secret Spring
Gulch
Harrison Spring
Moki Canyon
South Moki Canyon
North Moki Canyon
Sand Slide
NORTH GULCH AZIMUTH
Burnt Spring
Blue Canyon
Low Canyon
URANIUM
Red Canyon
Kathy Canyon
Wilson Canyon
Warm Spring
Talus Hole
EDGE
CY


Map 2
ALL WILDERNESS ALTERNATIVE
Mancos Mesa WSA
UT-060-181
Legend
All Wilderness Alternative (51,440 acres)
SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
R. 13 E.
R. 14 E.
T. 35 S.
T. 35½ S.
T. 36 S.
T. 37 S.
GLEN CANYON
NATIONAL RECREATION AREA
POWELL
LAKE
Mancos Canyon
MANCOS MESA
Cedar Gulch
Moki Canyon
Red Canyon
Rainbow Canyon
Piute Canyon
Blue Canyon
Low Canyon
South Fork
Castle Butte
Sandstone Knob
Kathy's Canyon
Wilson Canyon
Warm Spring
Good Hope Mesa
The Rincon
Jacobs Rock
Chocolate Drop
Jane Tank
Lone Pine Spring
Harrison Spring
Sand Slide
NORTH GULCH AZIMUTH
EDGE
POTS
URANIUM
RIM
SOUTH
North

in-holdings would be the same as those on adjacent Federal lands and no specific analysis is given here. (Refer to Volume I for further information on State in-holdings). The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located within the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 51,440 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the 2,438 mining claims (approximately 35,840 acres) that may be determined valid. Development would be governed by unnecessary or undue degradation guidelines (43 CFR 3809) with consideration given to wilderness values. Existing oil and gas leases covering the entire 51,440-acre WSA would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown prior to wilderness designation.
- Present domestic livestock grazing would continue as authorized in the South San Juan MFP. The 514 AUMs in the WSA would remain available to livestock as presently allotted. The use and maintenance of range developments existing at the time of designation would continue in the same manner as in the past based on practical necessity and reasonableness. It is assumed that after designation, new range developments would be allowed if necessary for the protection or effective management of the rangeland and/or wilderness resource and if it can be carried out consistent with wilderness protection standards (refer to Appendix 1). However, none are currently planned.
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if compatible with wilderness values, needed to correct an imminent hazard to life or property, or authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or watershed treatments are located in the Mancos Mesa WSA, and none are planned.
- Wildlife transplants or developments would be allowed after designation if compatible with wilderness values. None are now existing, and none are planned.
- The entire WSA area would be closed to ORV use except for: (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) occasional and short-term vehicular access approved by BLM for maintenance of approved rangeland developments. About 25 miles of existing vehicular ways would not be available for vehicular use except as indicated above. The approximately 1 mile of dirt road that borders the WSA and approximately 1 mile of "cherry-stemmed" road would remain open to vehicular use.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 51,440-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products at the present time, nor is any specifically planned.
- Visual resources in the WSA would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. It is assumed that firefighting would be limited to hand or aerial methods.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources.

Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.

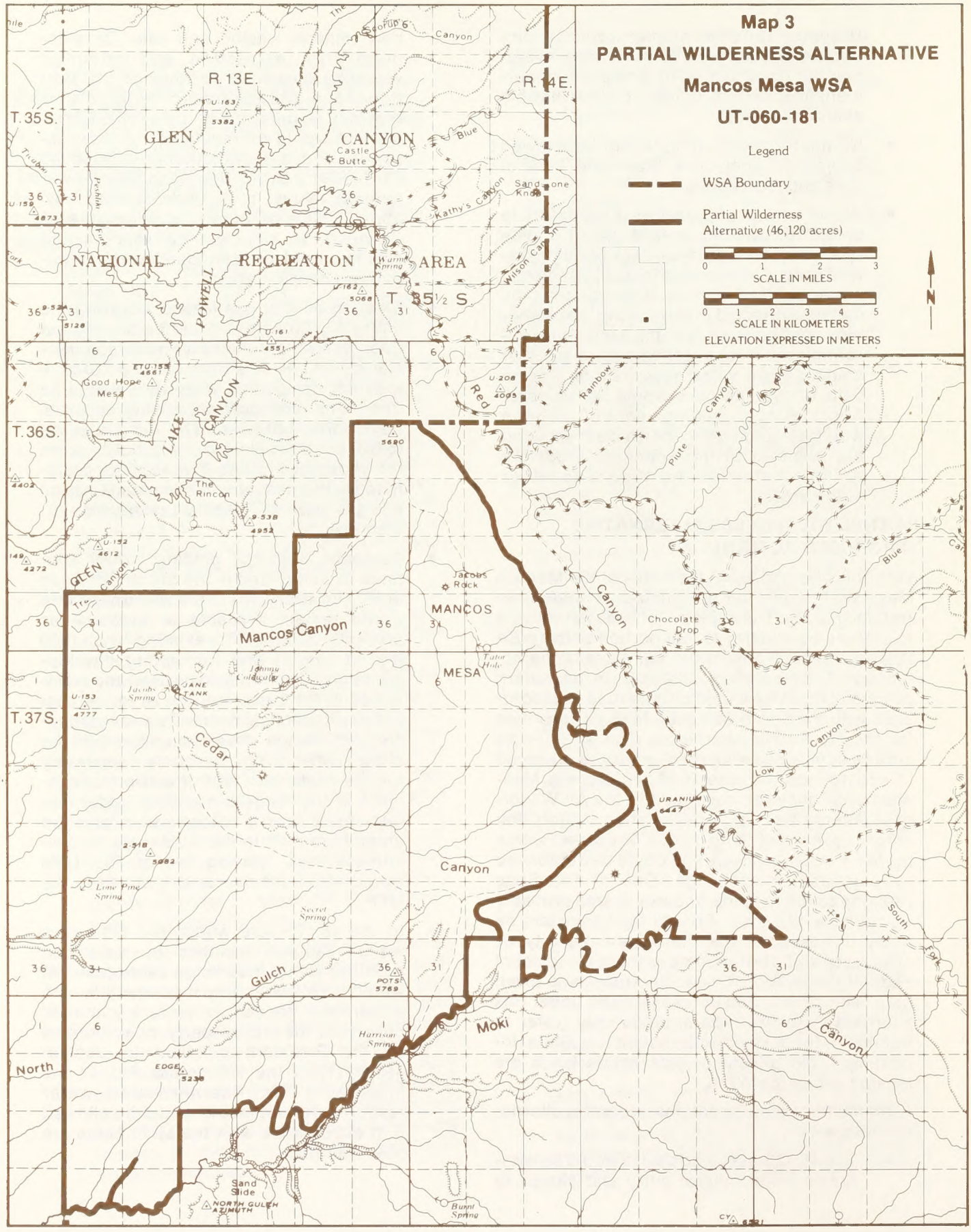
- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

PARTIAL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

With this alternative, 46,120 acres of the Mancos Mesa WSA would be designated as wilderness (refer to Map 3). The objective of this alternative is to analyze as wilderness that portion of the WSA that has the most outstanding wilderness characteristics. The remaining 5,320 acres in the eastern portion of the WSA would be managed in accordance with the South San Juan MFP as described for the No Action Alternative. The 46,120-acre area designated as wilderness would be managed in accordance with the BLM "Wilderness Management Policy" as described in the All Wilderness Alternative. Upon designation, acquisition of four sections of State land (2,561 acres) within the WSA would be likely and could be authorized by purchase or exchange. One of two State sections adjacent to the wilderness area probably would be exchanged. Should land transfers be made, it is assumed that management and types of impacts would be the same as those on adjacent Federal lands and no specific analysis is given here. The figures and acreages given under this alternative are for Federal lands only (refer to Volume I for further information on State inholdings). No private or split estate lands are located within the WSA.

A summary of specific actions under this alternative follows.

- The 46,120-acre wilderness would be withdrawn from mineral entry and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of about 32,256 acres of mining claims that may be determined to be valid. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809) with consideration given to wilderness values. In the undesignated area, about 3,584 acres of existing mining claims (if valid), as well as new valid mining claims, could be developed without wilderness considerations.
- Existing oil and gas leases, covering the entire 46,120 acres, would be phased out upon expiration unless a find in commercial quantities is shown. The 5,320-acre area not designated wilderness would be open to mineral location, leasing, and sale. Development of existing oil and gas leases (5,320 acres) could occur without concern for wilderness values. The area not designated wilderness would be managed as oil and gas leasing Category 1 (standard stipulations).
- Domestic livestock grazing would continue as authorized in the South San Juan MFP. The 435 AUMs in the wilderness area would remain available to livestock as presently allotted. The existing fence (660 feet in length) and two spring developments could continue to be used and maintained in the same manner as in the past based on practical necessity and reasonableness. Range developments would be allowed after designation only if necessary for the protection and effective management of the rangeland and/or wilderness resources, and if wilderness protection criteria are met. In the 5,320-acre nonwilderness area, grazing use of 79 AUMs would also continue as authorized in the MFP.
- In the 46,120-acre wilderness area, new water resource facilities or watershed activities (other than range developments) would be allowed only if compatible with wilderness, needed to correct imminent hazards to life and property, or authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act*. In the 5,320-acre nonwilderness area, water resource developments would be allowed if in accordance with the MFP. None are now planned.


Map 3
PARTIAL WILDERNESS ALTERNATIVE
Mancos Mesa WSA
UT-060-181
Legend
WSA Boundary
Partial Wilderness Alternative (46,120 acres)
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
R. 13E.
R. 14E.
T. 35S.
T. 35½ S
T. 36S.
T. 37S.
GLEN CANYON
NATIONAL RECREATION AREA
POWELL
Castle Butte
Sandstone Knob
Kathy's Canyon
Wilson Canyon
Warm Spring
Good Hope Mesa
LAKE CANYON
The Rincon
Red Canyon
Rainbow
Piute Canyon
Blue
GLEN Canyon
Jacobs Rock
MANCOS MESA
Mancos Canyon
Chocolate Drop
Jane Tank
Jacobs Spring
Cedar
Low Canyon
URANIUM
Lone Pine Spring
Secret Spring
Canyon
South Fork
Gulch
Moki
Harrison Spring
North
Canyon
Sand Slide
NORTH GULCH AZIMUTH
Bunni Spring

- In the wilderness area, wildlife transplants or habitat improvements would be allowed only if compatible with wilderness values. In the nonwilderness area, wildlife transplants or improvements would be allowed if in accordance with the MFP without consideration for wilderness values. None are now planned in either the wilderness or nonwilderness areas of the WSA.
- The 46,120-acre wilderness area would be closed to ORV use. The remainder of the unit would remain open to vehicular travel. About 6 miles of existing vehicular ways within the wilderness portion would no longer be available for vehicular use except for purposes identified under the All Wilderness Alternative.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 46,120-acre area. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads that are adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products in the wilderness area would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. The area not designated wilderness would be open to woodland harvest.
- Visual resources in the wilderness would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change. The area not designated as wilderness would be managed as Class II, as currently set forth in the South San Juan MFP.
- Within the wilderness area, measures to control fire, insects, noxious weeds, or disease would be taken only in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. It is assumed that firefighting would be by hand or aerial means. In the area not designated, measures of control would be taken without wilderness considerations.
- In the nonwilderness area, any activity for the purpose of gathering information about natural resources would be allowed by permit. In the wilderness area, such activity would be allowed by permit if compatible with wilderness preservation. It would be limited to that conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- In the nonwilderness area hunting would be allowed subject to applicable State and Federal laws and regulations. In the wilderness area, use would be allowed subject to applicable laws and regulations but limited to nonmotorized means.
- In the nonwilderness area, control of predators would be allowed to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. In the wilderness area, control of predators would be allowed for the same purposes, but only under conditions that would ensure minimum disturbance to wilderness values. Poison baits or cyanide guns would not be allowed.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Air Quality

The WSA has a Prevention of Significant Deterioration (PSD) Class II air quality classification under the provisions of the Clean Air Act, as amended. This classification allows for moderate increases in air pollution levels. The nearest PSD Class I area is Capitol Reef National Park approximately 18 miles to the west.

The air quality is generally very good over the WSA. Visual range in the vicinity of the Mancos Mesa WSA averages between 100 and 132 miles during the summer (Aerocomp, 1984).

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
MANCOS MESA WSA

Resource	Alternatives		
	No Action	All Wilderness (51,440 Acres)	Partial Wilderness Designation (46,120 Acres) (Proposed Action)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil, 18 billion cubic feet of natural gas, 500 to 1,000 tons of uranium oxide, and 50,000 tons of copper.	Oil and gas likely would not be recovered. Assuming a worst-case analysis, uranium and copper recovery would also be foregone. Due to the low likelihood of recovery of these mineral resources, however, the loss of development opportunity would not be significant.	Although likelihood is low, up to 0.3 million barrels of oil, 18 billion cubic feet of natural gas, 100 tons of uranium oxide, and 5,000 tons of copper could be recovered.
Wildlife	About 0.4 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.	Wildlife in the designated area would benefit from solitude. About 0.4 percent of the nondesignated portion could be disturbed by mineral and energy exploration and development, which could adversely affect wildlife habitat.
Livestock	Grazing of 514 AUMs and maintenance of existing developments would continue. New developments could be constructed; however, none are now proposed.	Grazing of 514 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected, although new developments proposed in the future might not be allowed.	Effects would be about the same as for the All Wilderness Alternative.
Visual Resources	The quality of visual resources could be impaired on up to 200 acres.	Visual quality could be impaired on up to 40 acres.	Visual quality could be impaired on up to 56 acres, including 36 acres in the designated portion. More than 99 percent of the Class B scenery would be in the designated portion and would be protected by the reduced potential for disturbance. There is no Class A scenery in the WSA.
Recreation	ORV use would continue on 25 miles of ways at current low levels. Overall recreational use could increase from the present 270 visitor days per year to 402 over the next 20 years. Up to 200 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including 25 miles of ways, would be closed to ORV use. Recreational use could increase to up to 5,144 visitor days due to publicity associated with wilderness designation.	ORV recreational use could continue on 19 miles of ways in the undesignated portion. Overall recreational use could increase to up to 4,600 visitor days following designation of part of the WSA.

TABLE 1 (CONTINUED)
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
MANCOS MESA WSA

Resource	Alternatives		
	No Action	All Wilderness (51,440 Acres)	Partial Wilderness Designation (46,120 Acres) (Proposed Action)
Wilderness Values	Wilderness values could be lost on up to 200 acres (0.4 percent of the WSA).	Wilderness values would be protected, except on up to 40 acres (less than 0.1 percent of the WSA) which may be disturbed by development of valid mineral rights.	Wilderness values would be protected, except on 36 acres which could be disturbed by development of valid mineral rights. Additional impairment could be expected on 0.4 percent of the 5,320 acres not designated. Overall, wilderness values could be lost on up to 0.12 percent of the WSA. However, all of the area meeting the standards for naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive recreation would be in the designated portion and would be protected by reduced potential for disturbance.
Land Use Plans and Controls	This alternative would be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the current BLM South San Juan MFP. It would not complement the NPS proposal for nearby wilderness.	This alternative would not be consistent with San Juan County's concept of multiple use. It would be consistent with State policy if lands were exchanged, and would complement the NPS proposal for wilderness. Designation would constitute an amendment of the BLM South San Juan MFP or forthcoming San Juan RMP.	Partial designation would be the same as the All Wilderness Alternative except that the portion not designated would be consistent with San Juan County's plans.
Socio-economics	Annual local sales of less than $54,387 and Federal revenues of up to $155,208 would continue.	Annual local sales of less than $54,387 and Federal revenues of up to $720 would continue, but Federal revenues of up to $154,320 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA, but increased recreational use might result in local sales of up to $21,090. Federal revenues could increase by $15,000 per year due to increases in commercial recreational use following wilderness designation.	The effects of this alternative would be the same as for the All Wilderness Alternative, except that annual Federal revenues would be reduced by up to $138,360. Local sales from recreational increases up to $18,860 might result from increased recreational use.

The closest air monitoring station to Mancos Mesa is 15 miles west at Bullfrog Marina. Particulate and sulfur dioxide concentrations are measured at Bullfrog. Only the short-term (24-hour) particulate standard has been exceeded at the Bullfrog station; the annual average is well below the standard at 60 micrograms per cubic meter for all three data years. The 24-hour violations were probably associated with conditions of high winds and blowing dust (resulting from the scarce vegetation and large areas of exposed sand).

Sulfur dioxide concentrations measured at Bullfrog Marina are low and well under the applicable ambient standards.

Geology

The Mancos Mesa WSA is within the Canyonlands Section of the Colorado Plateau Physiographic Province, characterized by bare rock surfaces, plateaus, and steep-walled canyons. Elevations range from 4,200 feet in the canyon bottoms to a high point of nearly 6,500 feet at the head of Cedar Canyon. Cedar Canyon and North Gulch serve as the drainage for the bulk of the surface of the mesa. The heads of several other canyons located within the Glen Canyon NRA are within the WSA boundary. The surface of Mancos Mesa dips slightly to the west, and all of the canyons drain westward into Lake Powell.

The meandering canyon walls are characterized by nearly vertical sandstone cliffs separated by steep, rocky talus slopes from rim to canyon floor. The deepest portions of Cedar Canyon and North Gulch are about 800 feet deep and have an average depth of 400 feet within the WSA.

The mesa is located on the gently dipping western flank of the Monument Upwarp and is composed of westward-tilted sedimentary beds of Permian to Jurassic Age with Quarternary dune accumulations. The Wingate Formation is exposed in the bottom of Cedar Canyon. The Kayenta Formation overlies the Wingate and forms extensive benches and steep-ledged slopes over approximately one-fourth of the surface area. Above the Kayenta lies the Navajo Sandstone, which makes up the majority of the surface area in the WSA. The long, sweeping cross beds of aeolian sand in the Navajo Sandstone produce attractive surface features. The Carmel Formation overlies the Navajo Sandstone, appearing in three very small erosional remnants on the southern edge of the WSA.

Soils

Shallow soils and rock outcrops predominate throughout the unit on the plateaus and in the canyons. The soils on the mesas and structural benches range from shallow to very deep loamy and sandy soils. The soils on the canyon slopes are shallow to very deep, and some of the slopes are covered by talus. Very deep soils generally occur in concave slope positions and in basins. Soil characteristics and land types are shown on Table 2. The average rate of soil erosion is about 0.45 cubic yard/acre/year as shown on Table 3.

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Bare Soil Surface
Shallow to very deep stony soils on steep mountainsides	15	7,716	1	10
Rock outcrop and rubbleland	45	23,148	0	0
Shallow loamy soils on sloping benches and ridges	30	15,432	1	5
Deep and very deep loamy soils on gently sloping alluvial fans and valley floors	10	5,144	0.1	1
Totals	100	51,440		

Source: Hansen, 1985.

TABLE 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/acre/year)	Annual Soil Loss Under Present Conditions: Percent of Area	Acres	Cubic Yards	Annual Soil Loss if Disturbed: Percent of Area	Acres	Cubic Yards
Very High	20	—	—	—	—	—	—
High	10	—	—	—	15	7,716	77,160
Medium	5	—	—	—	30	15,432	77,160
Low	1	45	23,148	23,148	10	5,144	5,144
Very Low	0.1	10	5,144	514	—	—	—
None	0	45	23,148	—	45	23,148	—
Totals	—	100	51,440	23,662[1]	100	51,440	159,464[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: .45 under present conditions; 3.1 if disturbed.

Vegetation

The vegetation of the Mancos Mesa WSA is classified as the blackbrush vegetation type for the entire 51,440 acres. Blackbrush communities are comprised of low growing plants that have an average height of 1 to 2 feet. Additional species include Mormon tea, yucca, winterfat, Indian ricegrass, curley grass, sandhill muhly, slenderbush eriogonum, scattered pinyon-juniper, and single leaf ash. Vegetation in a few small areas near springs in the canyon bottoms includes scattered cottonwoods, oak, skunkbrush, and rabbitbrush. No acreage is classified as riparian in the WSA; however, there are isolated patches of riparian vegetation in canyon bottoms.

There are no known threatened or endangered plant species in the WSA.

The Mancos Mesa WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) type of this WSA is blackbrush. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

Water Resources

Livestock, wildlife, and recreationists utilize eight springs (two developed) and the natural rock tanks on Mancos Mesa. Water quality is good. Water flows in the canyons only during thunderstorms or the limited spring snow melt.

There are no water wells on Mancos Mesa. Since 1979, 12 reservoirs have been constructed on State lands within the WSA. There are no perennial streams in the WSA.

Mineral and Energy Resources

The BLM, in consultation with the U.S. Department of Energy, had each WSA assessed for its energy and mineral resources by SAI (1982). The energy and mineral resource rating is given in Table 4. (Refer to Appendix 5 for a description of the SAI rating system.)

An overall importance rating (OIR) of 3 was assigned to the Mancos Mesa WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA.

TABLE 4

Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f2	c1	Less than 10 million barrels of oil; less than 60 billion cubic feet of gas
Copper	f2	c1	Less than 50,000 tons of contained copper
Uranium/Vanadium	f3	c2	500-1,000 tons of uranium oxide
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydroelectric	f1	c4	None
Potash	f1	c3	None
Manganese	f1	c1	None

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).

[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by FLPMA. BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. The WSA contains deposits of copper that is currently listed as a strategic and critical material (Federal Emergency Management Agency, 1983). Although listed as strategic, copper is relatively common, and supplies currently exceed domestic demand.

LEASABLE MINERALS

Due to unfavorable geologic conditions, it has been determined that no coal, potash, geothermal, or other leasable resources, with the exception of oil or gas, are present in this WSA. Also, no leases for these resources exist in the WSA.

Oil and Gas

Despite favorable stratigraphy in the WSA, structural factors suggest that any accumulations of oil and gas present would be small.

Mancos Mesa overlies two sedimentary sequences that are considered favorable stratigraphy for oil and gas production in southeast Utah. The mesa is situated over the western edge of the Paradox Basin and above a 400-foot accumulation of Devonian strata and 600 feet of Mississippian strata that are oil and gas producers in the Four Corners region. However, structural factors suggest that any accumulations present may be small.

The oil-rich strata of the Paradox Formation have been exposed along the San Juan River and the Colorado River in Cataract Canyon. If oil and gas were once accumulated in the Paradox in this area, there is a good possibility that any reservoir pressure that existed has been released, allowing the oil and gas to drain away. This does not preclude the possibility of small accumulations in isolated stratigraphic traps within the Paradox Formation.

A few exploratory wells have been drilled in the vicinity of Mancos Mesa, but none have been drilled on the mesa itself. All of the wells have been abandoned without production, but they did have shows of oil and gas staining. The low rating estimates a potential for less than 10 million barrels of oil or less than 60 billion cubic feet of gas.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases that are producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

The entire 51,440 acres of the WSA are covered by 31 post-FLPMA oil and gas leases. Oil and gas leasing categories were established for the WSA in 1975 and the entire WSA is in Category 1 (open with standard stipulations).

LOCATABLE MINERALS

At present there are 2,438 mining claims located within the Mancos Mesa WSA; they cover 35,840 acres, or about 70 percent of the surface of the WSA. About 430 claims on about 9,230 acres appear to have current assessment work.

Uranium, with copper and vanadium as a by-product, is the only known locatable mineral that may occur in the WSA. Uranium is commonly found in ancient stream channels of the Shinarump Member of the Chinle Shale throughout southeastern Utah, and the Shinarump underlies the entire WSA at depths of up to 1,000 feet from the top of the mesa. The moderate rating for uranium/vanadium indicates a potential for between 500 and 1,000 tons of uranium oxide and the low rating for copper suggests a potential for less than 50,000 tons of contained copper. These deposits could underlie all 51,440 acres of the WSA.

Although Mancos Mesa is not included in an organized mining district and there has been little production from the immediate area, the White Canyon Mining District lies about 10 miles to the northeast. White Canyon is one of the most productive districts to produce uranium from the Chinle Shale. Deposits in the district range in size from a few tons to 800,000 tons at a grade of 0.25 percent uranium oxide. However, most of the deposits contain less than 50,000 tons of ore.

Uranium exploration, which caused surface disturbance, has taken place on Mancos Mesa. Gulf Mineral Resources Company constructed roads and drilled exploratory holes in 1976 and drilled holes from these roads in 1977, 1978, and 1979 in

the southeast portion of the WSA. No exploration drilling has taken place since 1979.

SALABLE MINERALS

Because of the remoteness and inaccessibility of Mancos Mesa, no salable minerals are economically recoverable from the WSA. Sand and sandstone blocks are readily available throughout the region and are much easier to obtain in other locations.

Wildlife

The Mancos Mesa WSA is managed in accordance with the White Canyon-Red Canyon Habitat Management Plan. No habitat improvements have been identified for Mancos Mesa and there are no existing wildlife developments.

Desert bighorn sheep are occasionally sighted on Mancos Mesa and all of the 51,440-acre WSA has been designated as crucial habitat. Mancos Mesa is in the Utah Division of Wildlife Resources' (UDWR) South San Juan Herd Unit 701. A few mule deer utilize the area. The WSA is within UDWR Deer Herd Management Unit 31B.

Deer mice, whitetail antelope squirrel, cottontail rabbit, and western pipistrel utilize the area. Common raven, redtail hawk, blackthroated sparrow, canyon wren, violet-green swallow, and white throated swift are the most abundant bird species. Gopher snakes, side-blotched lizards, northern whiptails, leopard lizards, and desert spiny lizards are also found within the WSA.

Prairie falcon and possibly the endangered peregrine falcon are thought to be in this area. No eyries have been located. Other than the possibility of peregrine falcon, no other threatened or endangered wildlife species are suspected in the WSA. The chuckwalla, which has restricted habitat in Utah, has been reported but not confirmed in Cedar Canyon. No acres are identified as critical habitat.

Forest Resources

The Mancos Mesa WSA is a desert-type blackbrush environment with occasional scattered junipers. There is no forest resource in the WSA.

Livestock and Wild Horses/Burros

The Mancos Mesa WSA is within the Lake Canyon Grazing Allotment which is managed under an Allotment Management Plan. Current livestock use in the WSA is about 128 cattle from December 1 to March 31 each year (514 AUMs). Table 5 summarizes total allotment grazing use.

Range improvements on BLM-administered lands in the WSA include two developed springs and a one-eighth mile section of fence. Improvements on inheld State sections include 12 small reservoirs. When they are passable, the roads on the east border of the WSA are used by the livestock permittee and BLM in grazing management.

There are no specific range improvements proposed for the WSA. However, the grazing permittee has expressed a need for additional reservoirs, a line cabin (cow camp), and maintenance of the existing ways. Vegetation land treatments such as chaining or plowing are not feasible due to shallow soil depth.

There are no wild horses or burros within the WSA.

TABLE 5
Livestock Grazing Use Data

Allotment	Season of Use	Number of Livestock in Allotment	Number of Permittees	Total Number of AUMs in Allotment	Number of AUMs in WSA
Lake Canyon	10/16 to 6/5	600 cattle	1	4,800	512
		12 horses		96	2

Source: USDI, BLM, 1970.

Visual Resources

The Mancos Mesa WSA is in a VRM Class II area (51,440 acres). Class B scenery occupies 90 percent (46,300 acres) of the WSA and Class C scenery occupies 10 percent (5,140 acres). (Refer to Appendix 7 for a description of BLM's VRM rating system.)

The sensitivity level rating indicates the relative degree of user interest in visual resources and concerns for changes in the existing landscape character. The WSA contains a low sensitivity area, except the wilderness study may have increased public interest in the visual attributes of the area.

Cultural Resources

Little archaeological work has been conducted in the Mancos Mesa area and consequently there is a lack of site information for the WSA. Only two

cultural resource clearances related to mineral exploration have been performed here.

Archaeological work in other portions of San Juan County has helped to define the broad cultural periods recognized for the region today, most common of which are known as Anasazi.

Because of the inaccessibility of Mancos Mesa, this WSA potentially contains pristine cultural resources. A literature search revealed 13 recorded sites. Most of the sites on the mesa appear to represent limited activity, primarily hunting and gathering (lithic scatters), while those in the canyon appear to represent more permanent habitation (shelters).

There are no existing National Register sites and/or nominations in this WSA. However, based on estimates from similar settings in the area, it could be expected that up to 1,206 sites would be located in the WSA of which 804 could be eligible for National Register status.

Recreation

For the most part the inaccessibility of Mancos Mesa has discouraged recreationists. Only the most ardent of back country enthusiasts attempt the steep trails leading onto Mancos Mesa. Water is found in limited locations on the mesa top. The exception would be during periods of rainfall when the natural rock tanks would provide a water source.

A road does now exist (built in 1976) that provides access out of Moki Canyon to the top of Mancos Mesa. At the present time the road is impassable to all motorized vehicles except trail or motorbikes. No recorded information is available as to numbers of private recreational users in the area. Some use does occur from the western boundary by visitors to Lake Powell. Recreational activities include hiking, climbing, backpacking, horseback riding, sightseeing for botanical, geological, zoological, or archaeological features, and photography.

In recent years, Griffith Center (based in Colorado) has used Mancos Mesa and Cedar Canyon as one of its hiking areas for organized groups. They average two trips a year lasting 14 days per trip, with 12 persons per trip, accounting for 168 visitor days.

Although Mancos Mesa is in a designated bighorn sheep hunting unit, no information is available on bighorn sheep hunting in the WSA. Some mule deer hunting may have occurred on Mancos Mesa in the past but the area has been closed to deer hunting since 1980.

Total annual recreation use in the Mancos Mesa WSA is estimated at about 270 visitor days/year, including the commercial group activities that comprise about 62 percent of the existing use.

Wilderness Values

SIZE

The WSA contains 51,440 acres of public land and is of sufficient size to enhance the wilderness values present.

NATURALNESS

Approximately 46,120 acres of this unit are free of the imprints of man's activity and meet the naturalness criteria for areas under wilderness review. The remaining 5,320 acres contain significant imprints and do not meet the naturalness criteria.

Construction of 25 miles of roads associated with mineral exploration in the area required significant rock cutting and earthmoving. About 20 drill pads were constructed adjacent to the roads. The disturbed areas cover less than .25 acre per site. Partial revegetation and drifting sand obscure short sections of the roads and some of the drill pads. These imprints occurred after the passage of FLPMA on pre-FLPMA mining claims, were rehabilitated as much as possible, and closed. Currently, the roads are not accessible by four-wheel drive vehicles; however, motorcycle tracks are evident on some of the abandoned roads. The roads and drill pads can only be seen from the plateau high points in the southeast portion of the WSA.

Range improvements on BLM lands include Potatoe Hole Spring and stock trail, Jacob's Spring, and a one-eighth mile section of fence. Impacts include relics of an old wooden watering tank at Jacob's Spring. The fencing is contiguous to the eastern boundary where a road exists. The impacts of the spring improvements are negligible.

SOLITUDE

The deeply entrenched meandering canyons and small tributaries within the WSA afford outstanding opportunities for solitude. The winding and irregular canyon walls provide vertical isolation. Occasional pockets of riparian vegetation provide some screening in the canyon bottoms. On the mesa top the sand dunes, steep slides, winding slickrock faces, bluffs, buttes, and other erosional features in combination with the low desert

shrubs afford screening necessary for outstanding opportunities for solitude. The vastness of the mesa enriches the sense of seclusion.

The roads in the southeast portion of the WSA are visible from the plateaus that they cross and high points along those plateaus. Occasional motorcycle use occurs on these roads. These conditions can be perceived to diminish solitude in the southeast portion of the unit.

Lake Powell is visible from high points in the northern and western portions of the WSA. Roads, uranium tailings, and exploration activities to the east of Red Canyon can be seen from various points along the rim of Red Canyon. The roads appear to receive very little use since mining is not currently active. These off-site influences produce a minimal impact to solitude due to the distances involved. Commercial airline traffic over the WSA occurs daily. The impact upon wilderness solitude is negligible due to the altitude of the air traffic.

Approximately 90 percent (46,120 acres) of the WSA meets the outstanding solitude criterion for areas under wilderness review. The remaining 10 percent (5,320 acres) of the WSA in the southeast corner of the unit does not meet the criterion.

PRIMITIVE AND UNCONFINED RECREATION

The opportunities for dispersed, undeveloped recreation within this WSA are excellent, being limited only by seasonal availability of water. The interesting sandstone formations within the extensive canyon and plateau systems offer excellent opportunities for hiking and exploration by backpackers, climbers, and horseback riders. Other outstanding opportunities include sightseeing, photography, and scientific and educational studies. The dissected landform on the mesa forms a barrier which necessitates circuitous routes between travel points.

Intrusions in the southeast corner of the WSA impact the primitive and unconfined recreation experience. The roads do provide the only good access to the mesa, but tend to limit the primitive and unconfined recreation experience.

The outstanding backpacking and horseback riding opportunities within the canyons and on the plateaus allow 90 percent (46,120 acres) of this WSA to meet the criterion for outstanding primitive and unconfined recreation. The remaining 10 percent (5,320 acres) in the southeast corner of the WSA does not meet the criterion.

SPECIAL FEATURES

The Mancos Mesa WSA contains values of supplementary interest that include archaeological, historical, geologic, wildlife, and scenic considerations. There are 13 recorded archaeological sites and a potential for up to 1,206 additional sites.

Land Use Plans and Controls

The Mancos Mesa WSA is composed primarily of public land with both the surface and subsurface managed by BLM. However, there are seven sections (4,482 acres) of State-owned surface and subsurface. State policy is to manage these lands to maximize economic return to provide funding for schools. These lands are under mineral and grazing lease. There are three sections of State lands adjacent to the WSA. The Glen Canyon NRA forms the north and west boundaries of the WSA. BLM-administered public lands are adjacent to the east and south boundaries of the WSA.

There are no existing land use rights-of-way issued by BLM in the WSA.

Access to the WSA is provided by Red Canyon Road, which forms the east boundary, and a dirt road on the south. Both of these roads are county maintained. There are three roads on the mesa that were constructed in 1976 for mining exploration. These roads were closed after exploration in 1977, 1978, and 1979. There is no other access within the WSA.

NPS has proposed 41,700 acres of lands in Glen Canyon NRA adjacent to the north and west boundaries of Mancos Mesa for the Moki-Mancos Mesa wilderness.

The BLM South San Juan MFP recognizes the wilderness values but also provides for multiple use of Mancos Mesa area. The San Juan RMP will replace the MFP in 1986. The RMP will acknowledge the wilderness study but will not cover wilderness designation.

The *San Juan County Master Plan* (Planning and Research Associates, 1967) emphasizes multiple use of public lands and zones the WSA as open range and forest land. However, the San Juan County Commission (1980) opposes any legislative or administrative designations of wilderness in the County.

Socioeconomics

DEMOGRAPHICS

The WSA lies in western San Juan County. The nearest community is Blanding. The socioeconomic effects of designation would be mostly confined to San Juan County, which is rural and sparsely populated.

San Juan County had a 1982 population of 12,700, not quite one percent of the state population (University of Utah, Bureau of Economic and Business Research, 1982). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers. Monticello, the county seat, had a 1980 population of 1,930 and Blanding, about 20 miles south, had a 1980 population of 3,120 (U.S. Department of Commerce [USDC], Bureau of the Census, 1981).

San Juan County is the largest county in Utah, comprising 7,885 square miles (about the size of New Jersey). About 86 percent of the county is owned by the Federal Government, 6 percent by the State, and 8 percent by private landowners (University of Utah, Bureau of Economic and Business Research, 1982). The southern 20 miles are part of the Navajo Indian Reservation.

EMPLOYMENT

Even though local employment in the mining industry has decreased by 20 percent between 1980 and 1982 due to a downturn in local uranium mining and milling, it still remains the largest local private employer (Utah Department of Employment Security, 1983).

Recent statistics indicate that mining directly accounts for half of the income and over 32 percent of the employment in the county (refer to Table 6). Because the mine operators and mine employees purchase local products, mining's total local importance is even greater. Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are on welfare and do not show up on unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

INCOME AND REVENUES

Activities in the WSA that could be of any local economic consequence include mining claim assessment, livestock production, and dispersed nonmotorized recreation. Table 7 summarizes local sales and Federal revenues from the WSA. Appendix 9 identifies the multipliers used to estimate income and revenues.

TABLE 6

1981 Employment and Income
San Juan County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance, and Real Estate	1	1
Services	8	11
Other	—	—
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	96
Unemployment (1st Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

NOTE: Employment percentage figures include only wages and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services. Because of rounding, numbers are not additive.

TABLE 7

Local Sales and Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	$154,320
Mining Claim Assessment	$43,000	None
Mineral Production	None	None
Livestock Grazing	$10,280	$720
Recreational Use	Less than $1,107	$168
Total	Less than $54,387	Up to $155,208

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total local income that would be generated by these expenditures.

There are 430 mining claims with current assessment work in the WSA. Regulations require a $100 expenditure for labor and improvements per claim to keep the claim current. Some of these expenditures would probably be made within the local economy.

One livestock operator has grazing privileges in the WSA. Based on the consumption of 514 AUMs of forage by livestock, it is estimated that the Mancos Mesa WSA accounts for $10,280 of livestock sales, including $2,570 of the rancher's returns to labor and investment.

Although there is desert bighorn sheep habitat in the WSA, there is little to none private or commercial hunting within the WSA itself and, therefore, the WSA accounts for few if any hunting-related local expenditures. Other recreation use within the WSA is low. The actual amount of income generated locally from recreational use in the Mancos Mesa WSA is unknown. However, an approximate range of expenditures can be deduced (Dalton, 1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for the WSA is estimated as about 270 visitor days/year, for an estimated local income of $1,107. Only a portion of the expenditures for recreational use of the WSA contributes to the local economy of San Juan County.

Included in the recreation use are an estimated 168 visitor days attributable to commercial outfitters. This use results in an estimated $8,400 annual income to nonlocal business and $168 annually in Federal revenues.

The WSA generates revenues to the Federal Treasury from two other sources: grazing and mineral leasing. Within the WSA, 51,440 acres are currently leased for oil and gas. At $3 per acre, this generates about $154,320 annually. Half of this, or about $77,160, is allocated back to the State of Utah. The State then reallocates these revenues to various funds, the majority of which are related to energy development. The grazing capacity of the WSA is about 514 AUMs. Based upon 514 AUMs of forage consumed by livestock in the WSA and a grazing fee of $1.40, the WSA annually accounts for $720 of grazing fee revenues to the Treasury. Half of this is allocated back to the local BLM District for the construction of range projects in the region.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines For All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area would be related to oil, gas, and locatable mineral exploration and development. The area would be

open to resource use and development without control for wilderness protection. The degree of future development is unknown, but probably would be low due to the WSA's rough terrain, better resource opportunities outside the WSA, and economic factors. The following is an analysis reflecting ultimate development, based on the assumption that minerals would be extracted sometime in the future and would result in the following disturbance: oil and gas, 160 acres; and uranium and copper, 40 acres. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed as a PSD Class II area. Disturbance of 200 acres would result in only minor temporary increases in fugitive dust emissions; however, over the long term, air quality would remain essentially as at present.

GEOLOGY

No impacts to geology are expected because exploration and development activities associated with locatable minerals (i.e., uranium, copper, and oil and gas) probably would not exceed 200 acres, affecting only small scattered locations.

SOILS

It is estimated that up to 200 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about .45 cubic yard/acre/year. Soil loss on the 200 acres would increase from 90 cubic yards/year to 620 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 530 cubic yards (2 percent) over current annual soil loss.

VEGETATION

The anticipated maximum of 200 acres disturbed would not significantly impact the sparse blackbrush vegetation of the Mancos Mesa WSA. There are no endangered, threatened, or sensitive species within the WSA.

WATER RESOURCES

Since precipitation is low and all streams are ephemeral within the WSA, no significant sedimentation or change in total dissolved solids (TDS) is expected to occur from the 530 cubic yards of annual increased soil loss from surface disturbance.

Opportunities for expansion and maintenance of water sources such as reservoirs could occur. However, no water developments are planned for the WSA.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

The potential for up to 3 million barrels of oil and up to 18 billion cubic feet of natural gas estimated to be recoverable could be explored and developed, subject to Category 1 stipulations. However, due to the small size of these deposits, no oil and gas production is expected under this alternative.

Locatable Minerals

Uranium and Copper

Locatable mineral development could occur within the WSA. The entire WSA would remain open to mining claim location. The potential deposit of less than 50,000 tons of contained copper and 500 to 1,000 tons of uranium oxide could be extracted. Any additional exploration drilling and related access likely would occur within the WSA. If production mining were to occur, the mine adits, mine dumps, and stockpiles most likely would be outside of the WSA boundary because the outcrops of the uranium-bearing Chinle Formation occur on the flanks of the mesa. However, the likelihood of development is thought to be minimal in the foreseeable future because of economic considerations (e.g., depth of the minerals and poor market conditions).

WILDLIFE

With this alternative, wildlife could be adversely affected by possible surface-disturbing activities on up to 200 acres. Surface-disturbing activities could possibly occur at scattered locations within the 51,440 acres of crucial desert bighorn sheep habitat. If surface-disturbing activities, along with related vehicle access use, were to dramatically increase and negatively impact watering places or lambing and rutting grounds, a portion of the South San Juan bighorn sheep herd could be lost. This impact is considered unlikely due to low probability of development and implementation of protective actions. Should mineral activities occur, adverse impacts would be short-term while work was ongoing. Deer and mobile nongame animals would be dispersed from the area for the

lifetime of these activities. Less mobile wildlife would either perish or co-exist with these disturbances at smaller and less viable population levels. The endangered peregrine falcon (thought to occur in this area) would avoid the disturbed area. Before authorizing surface-disturbing activities (200 acres potential), BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the Fish and Wildlife Service (FWS) as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken, it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be preserved with the No Action Alternative.

FOREST RESOURCES

Since the dominant vegetation is blackbrush and there are few trees located in the Mancos Mesa WSA, no significant impacts to forest resources are expected.

LIVESTOCK

Domestic livestock grazing would continue as authorized in the South San Juan Planning Unit MFP and subsequent BLM planning documents. The 514 AUMs currently allocated in the WSA would continue to be utilized. Additional roads or other facilities for livestock handling could be proposed and developed in the future without regard for wilderness values; however, none are now proposed by BLM. Additional facilities as suggested by the livestock operator (reservoirs, roads, and a line cabin) could be considered and perhaps implemented in the future. Since motorized vehicles are currently used very little to manage livestock in the WSA, few, if any, changes in livestock management techniques are expected unless new roads are constructed.

VISUAL RESOURCES

With this alternative 200 acres of mineral-related exploration and development are possible. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. VRM objectives would probably not be met in Class II areas during the short term. Even after rehabilitation, some permanent localized degradation would be expected. If roads, vehicular ways, and drill pads are located throughout most of the 51,440 acres (worst-case analysis), visual quality could be significantly reduced in the WSA as a whole. However, the possibility of such significant impact is low because of the low likelihood of extensive energy and mineral exploration and development. Facilities as proposed by the livestock operator could result in visual intrusions, but on a much smaller scale than would be associated with energy and mineral activities.

CULTURAL RESOURCES

Protection of cultural values would continue as currently provided. Disturbance of 200 acres by mineral exploration and development under this alternative could affect potential National Register sites. However, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would mitigate impacts. Inadvertent loss or damage could occur in the disturbed area. The overall effect on cultural resources is unknown, but less than 1 percent of the estimated 1,206 potential cultural resource sites could be disturbed. There are no existing National Register sites and/or nominations in the WSA. Vandalism would continue to be a problem and would increase in proportion to the general population increase.

RECREATION

The entire 51,400 acres would be open to ORV use. Although ORV use could continue along the 25 miles of ways and abandoned roads, the rugged terrain prevents ORV access to much of the WSA. Primitive recreation values would not be enhanced or given special protection. Outstanding recreational opportunities could be reduced in localized parts of the WSA due to conflicts created by differing recreational user groups, plus the 200 acres of surface disturbance caused by energy and mineral exploration and development.

The future trend in recreational use of the Mancos Mesa WSA is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent/year over the next 20 years. At this rate, overall recreational use is expected to increase from the current 270 visitor days/year to 402 at the end of 20 years. Overflow from Glen Canyon NRA could further increase the use on the north and west sides of the WSA.

Commercial group use, which is now very dependent on the high quality primitive attributes of Mancos Mesa, could decrease substantially (or be entirely eliminated) if mineral-related disturbances were to occur throughout the WSA.

WILDERNESS VALUES

None of the area would be designated wilderness, and management would be under the existing South San Juan MFP and subsequent BLM planning documents. Due to the topographic character of the majority of the WSA, primitive recreation values and wilderness qualities have been protected from other resource uses in and around the WSA. Potential mineral and energy exploration and development could disturb an estimated 200 acres.

Wilderness values in the WSA (i.e., naturalness, opportunities for solitude and primitive recreation, and special features) could be lost or diminished in affected areas. However, the impacts to these values probably would not be significant due to the limited surface disturbance anticipated. However, the 200 acres of mineral-related surface disturbance could result in significant loss of naturalness and solitude throughout the WSA as a whole if roads, vehicular ways, and drill pads are located throughout the area.

LAND USE PLANS AND CONTROLS

This alternative (no wilderness designation) would be consistent with the *San Juan County Master Plan* which recommends this area be open range and forest land. It would also be consistent with the BLM land use plans because present multiple-use management would continue. It would not complement the NPS plans for wilderness designation in the adjacent portion of Glen Canyon NRA. This alternative would be consistent with the State of Utah plans and policies which foster economic return.

SOCIOECONOMICS

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain. A portion of the $100 per year assessment fee required for each mining claim would reach the local economy. If the uranium in the WSA were developed, it would not lead to a significant increase in employment and income for San Juan County, but could offset some of the current mining unemployment. However, the probability of mineral development within the WSA is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would not be livestock-related economic losses because the existing grazing use (514 AUMs) and ability to maintain, replace, and build new range projects would continue. The forage use in the allotment would continue to produce $10,280 annually in livestock sales and $2,570 of ranchers' return to labor and investment.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase by only 132 visitor days, the increased local income would amount to only about $541, only a portion of which would contribute to San Juan County's economy. Therefore, recreation-related expenditures attributable to the WSA likely would not be significant to the local economy.

Surface-impacting activities that could occur without wilderness designation could reduce the demand for commercial outfitter services now using the area. Decreased demand would be significant to the income of commercial outfitters who use the WSA but would be insignificant in terms of the local economy and other individual businesses.

Federal and State revenues could be reduced slightly by this alternative. There are no acres in the WSA open to leasing that are currently not leased. If and when they expire, these leases could be reissued to continue the $154,320 of lease fees. Half of these monies would continue to be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees ($720 per year) would continue. About 50 percent of the increased revenues would be returned to the local BLM office and some of this money would reach the local economy due to purchase of materials and services for use in range improvement projects. Commercial recreational use permits that generate approximately $168 annually could decrease if disturbance were to result in reduced commercial recreation use.

All Wilderness Alternative (51,440 Acres)

As identified in the Description of the Alternatives section, the major changes that could occur in the 51,440-acre Mancos Mesa WSA would be related to its withdrawal from mineral location and closure to new mineral leasing and sale. The entire area would be placed in leasing Category 4 (closed to leasing). About 25 miles of existing

vehicular ways in the WSA would be closed to vehicular use except for approvals by BLM as discussed in the Description of the Alternatives section. The WSA would be managed under VRM Class I.

For the following analysis it is assumed that the existing mining claims would eventually be explored and developed, causing an estimated 40 acres of disturbance within the WSA. It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing of oil and gas or combined hydrocarbons would not be allowed. (Appendix 10 lists surface disturbance assumptions and estimates for the WSA.)

Because potentially disturbed areas for this alternative would be smaller than under the No Action Alternative (40 versus 200 acres), the impacts from development and surface disturbance on air quality, geology, soils, vegetation, water, forest, and cultural resources under the All Wilderness Alternative would be insignificant as described for the No Action Alternative. It is concluded that reduction of surface disturbance because of wilderness designation would provide additional protection to these resources. Other effects due to changes in management are discussed below.

SOILS

It is estimated that up to 40 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.45 cubic yard/acre/year and this would increase to 3.1. Soil loss on the 40 acres would increase from 18 cubic yards/year to 124 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 106 cubic yards over current annual soil loss, but it would be 496 cubic yards less than the No Action Alternative.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

The entire 51,440 acres are included in post-FLPMA oil and gas leases. However, no exploration or development of oil and gas is presently occurring within the WSA.

Existing post-FLPMA leases could be developed subject to the wilderness protection stipulations issued at the time of leasing. It is unlikely that existing leases would be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases would not be reissued.

Exploration for and development of a potential resource of up to 3 million barrels of oil and less than 18 billion cubic feet of natural gas considered to be potentially recoverable could be foregone under this alternative. However, since no production of oil and gas is anticipated even with the No Action Alternative, and due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities, it is concluded that this alternative would not result in any significant loss in recovery of potential oil and gas resources.

Locatable Minerals

Uranium and Copper

Approximately 35,840 acres within the WSA have mining claims, principally for uranium. The potential exists for 500 to 1,000 tons of uranium oxide and less than 50,000 tons of copper to occur within the WSA. Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designationn under unnecessary or undue degradation guidelines, with consideration give to wilderness values.

The worst-case impact to minerals would occur if the potentially recoverable minerals are not within mining claims filed prior to wilderness designation. In that case the potential for recovery of 500 to 1,000 tons of uranium oxide and less than 50,000 tons of copper would be foregone. Because production of these metals is not occurring and because economic considerations (e.g., depth and market conditions, etc.) are unfavorable, it is unlikely that exploration or development would occur in the foreseeable future, even without wilderness designation. Therefore, the designation of the Mancos Mesa WSA as wilderness would not be a limiting factor that would cause any significant loss of recoverable uranium and copper resources.

WILDLIFE

With this alternative, some wildlife could benefit due to the preservation of solitude; however, populations would remain low because water is a limiting factor for wildlife in this WSA.

Bighorn sheep may migrate into the area, but their numbers would remain low due to the limited availability of water. Wilderness designation would protect all but 40 of the 51,440 acres of crucial yearlong desert bighorn sheep habitat identified in the WSA.

There are no wildlife-related vegetation treatments or facilities planned within the WSA; therefore, habitat conditions would remain essentially unchanged in the future. This would be similar to the No Action Alternative except there would be 160 acres less habitat disturbance from mineral activities.

The 40 acres of disturbance due to exploration of locatable mineral resources could impact wildlife populations in the same manner, but at a lesser magnitude than the No Action Alternative.

The possibility for peregrine falcon would continue because habitat would remain the same in much of the WSA, except on those 40 acres of mineral disturbance. This area would be avoided by the species. Because necessary measures would be taken to protect this species, as described for the No Action Alternative, the peregrine falcon would not be adversely affected by wilderness designation but would benefit from solitude and reduction of surface disturbance.

LIVESTOCK

Present domestic livestock grazing would continue as authorized in the South San Juan MFP. The 514 AUMs currently allocated in the WSA are used by the cattle of one livestock operator. Since very little use of motorized vehicles is currently taking place to manage livestock, little effect on the existing management of livestock grazing is expected.

Rangeland improvements (two springs and a fence) would be maintained as in the past, based on practical necessity and reasonableness. If consistent with wilderness standards, new rangeland improvements would be allowed if determined necessary for the purposes of rangeland and/or wilderness protection and the effective management of these resources, although none are currently planned by BLM. New roads, reservoirs, and a line cabin suggested by the operator using the Lake Canyon Allotment would not be allowed in the wilderness area. This could impact the future convenience and utility of the livestock operations in the area.

VISUAL RESOURCES

A slight benefit would occur to the exceptional visual resources of the WSA because the VRM class would change from Class II to the more restrictive Class I. Wilderness designation would contribute to the preservation of the area's visual resources. With this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through continuation of the ORV closure, and closure of the entire area to future mineral leasing and mining claim location.

With this alternative, the disturbance from the possible mineral-related surface disturbance would be an estimated 40 acres associated with development of valid mining claims. This would be 160 acres less visual disturbance than with the No Action Alternative.

Although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on localized, disturbed areas. Even after rehabilitation some permanent localized degradation could be expected. If roads for access to valid mining claims were constructed (worst-case analysis), VRM Class I objectives may not be met on portions of the WSA. However, because the potential for development of mining claims is low in the foreseeable future, visual quality would probably not be reduced in the WSA as a whole.

CULTURAL RESOURCES

There is a potential for increased vandalism to cultural resources due to increased recreational use of the WSA. However, protection afforded by wilderness management would outweigh any potential vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

The entire 51,440 acres would be closed to recreational ORV use, including the approximately 25 miles of ways. Motorcycle riding and ORV use are two popular activities in the area surrounding the Mancos Mesa WSA, and a few recreationists have been known to ride in portions of the WSA. Exact user numbers are unknown; however, field observations and public response indicates ORV use in the WSA to be less than 100 visitor days/year. Although nearly all ORV use would be eliminated, some limited (nonrecreation) ORV use in connection with valid rights could continue following designation, as discussed in the Description of the Alternatives section.

With wilderness designation, primitive recreation values would be enhanced, especially when specific management goals are derived to protect the opportunities present. By increasing publicity and public awareness of the area, designation could result in increased recreational use of the WSA. Judging from the WSA's site characteristics, population distribution about the site, and availability of similar sites, use with designation could ultimately reach an estimated 5,144 visitor days/year. Management that would be provided through a Wilderness Management Plan would regulate any possible destructive increases in future recreation use and, due to the size and configuration of the WSA, the quality of the primitive recreation experience probably would not be negatively affected by the increased use. The less than 100 visitor days of ORV play activity and/or vehicular sightseeing in the WSA that could occur without designation would be eliminated from the WSA. Because there are other suitable ORV play areas in the vicinity of the WSA, ORV use would probably not experience an overall decline in the vicinity of the WSA.

Commercial outfitting oriented to primitive outdoor activities would benefit. Commercial group use could increase substantially, perhaps to 1,000 visitor days/year. As this recreation use increased, other commercial operations based on primitive recreational activities could apply for use of the WSA.

WILDERNESS VALUES

Designation and management of all 51,440 acres as wilderness would contribute to the preservation of the wilderness values of size, naturalness, and opportunities for solitude and primitive and unconfined recreation (outstanding on 46,120 acres). The special features in the WSA (i.e., primarily geologic and scenic resources) also would be protected and preserved.

Wilderness values such as naturalness would benefit from the prevention of surface-disturbing activities. The 51,440 acres would be closed to ORVs. Motorcycle riding mostly takes place in the surrounding area and specific old roads and drainage areas in the southeast part of the WSA. Tracks within these areas would reclaim as they do after flooding of the drainage over time. Some vehicle use associated with grazing or valid existing rights for mineral use could continue.

Mineral-related surface disturbance has affected wilderness values on 5,320 acres, and additional disturbance on 40 acres for development of valid mining claims could cause a loss of naturalness and outstanding opportunity for solitude within other parts of the WSA. Mitigation to protect wilderness values would be considered during mining claim development, but road construction and use of motorized equipment could be allowed for development of valid mining claims if there are no reasonable alternatives. There are 35,840 acres under mining claims, but potential for mineral development in the foreseeable future is low primarily due to economic constraints related to uranium. Mineral-related disturbance (including access) could eliminate solitude, naturalness, and the opportunity for primitive and unconfined recreation on the affected areas, but these values would probably not be reduced throughout the WSA as a whole. Any loss of these values with wilderness designation would be less likely than with the No Action Alternative. Also, hiking, backpacking, rock scrambling, and other primitive types of recreational activities would probably be more popular with wilderness designation as a result of growing public awareness of the area.

Thus, it is concluded that wilderness designation and management of all 51,440 acres of the Mancos Mesa WSA would protect and preserve the wilderness values of naturalness, special features, and opportunities for solitude and primitive recreation (outstanding on 46,120 acres), except in localized areas affected by the surface disturbance related to mineral exploration. In the area as a whole, however, no significant loss of wilderness values on 46,120 acres would be expected and in the 5,320 acres that currently do not meet the criterion for naturalness and solitude, wilderness values could be partially reclaimed over the long term.

LAND USE PLANS AND CONTROLS

If State land within the WSA is exchanged for land outside the WSA, designation would not conflict with the State's policy of maximizing economic return.

The existing BLM South San Juan MFP does not provide for wilderness designation. The forthcoming San Juan RMP will acknowledge the wilderness study process but will not address wilderness designation. Congressional designation of the WSA as wilderness would be an amendment to the MFP and/or the San Juan RMP scheduled for completion in 1986.

Wilderness designation of the Mancos Mesa WSA would complement the NPS plans for wilderness designation in the adjacent portion of the Glen Canyon NRA.

Designation of the WSA as wilderness would be inconsistent with the multiple-use concept of the *San Juan County Master Plan* which zones the area for open range and forest lands. The All Wilderness Alternative would place restrictive conditions on expansion of livestock facilities, road construction, and mineral development. Also, oil and gas leases would be phased out.

SOCIOECONOMICS

Overall, there would be no significant changes in current trends of population, employment, and local income distribution.

The potential for mineral development in the Mancos Mesa WSA is expected to remain low due to national economic factors (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Valid existing oil and gas leases and mining claims could be developed but designation would preclude new leases and claims from being established in the WSA. Since no production now occurs in the WSA, precluding exploration and development of minerals would not alter existing economic conditions but could alter future economic conditions from what they would be with mineral development under the No Action Alternative. Because the potential for mineral development is considered low, it is estimated that potential mineral-related local income would not be significantly reduced by wilderness designation. However, any local income related to assessment of future mining claims would be lost.

Livestock use and ranchers' income would continue essentially as at present with $10,280 of livestock sales and $2,570 of ranchers' return to labor and investment. Proposed improvements for livestock could be foregone along with any resulting increase in ranchers' income. No such potential range improvements have been proposed by BLM; however, the rancher using the Lake Canyon Allotment has suggested new reservoirs, access roads and a line cabin, and any income or increased efficiencies in livestock operations related to these would be foregone.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use to an estimated 5,144 visitor days/year. Related local expenditures would be small (average of $4.10 per visitor day statewide) but could be as much as $21,090, a portion of which could be spent in San Juan County. Increased income from commercial group use could result in up to an estimated $50,000 income/year and would be significant to the one commercial outfitter who now uses the WSA and those that may begin to use the WSA.

Motorized recreational use of the Mancos Mesa WSA is light. The decrease in related local expenditures would be small and insignificant to both the local economy and individual businesses.

Because of restrictions placed on the use of resources with wilderness designation there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 7) as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative.

The loss of 51,440 acres now leased would cause an eventual loss of up to $154,320 per year of lease fees to the Federal Treasury. One-half of the lost revenues would have gone to the State of Utah.

No existing Federal income from rights-of-way or permits would be eliminated by wilderness designation since none exist in the WSA. Increased recreation group use could result in commercial permit fees of up to $1,000 in Federal revenue.

Partial Wilderness Alternative (46,120 Acres) (Proposed Action)

This alternative would designate all but the southeastern corner of the Mancos Mesa WSA as wilderness (refer to Map 3). The major activities that would occur in the designated portion of the WSA for this alternative are the same as described for the All Wilderness Alternative. For the nondesignated portion, management would be as described for the No Action Alternative. The specific actions that would take place within the 46,120-acre area designated as wilderness and the 5,320-acre nondesignated area are discussed in the Description of the Alternatives section.

It is assumed that, in the designated area, some of the existing mining claims would eventually be explored and developed, causing an estimated 36 acres of disturbance. It is also assumed that existing oil and gas leases in the designated portion would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing of oil and gas or combined hydrocarbons would not be allowed.

It is assumed that, within the nondesignated area, 20 acres would be disturbed sometime in the future due to mineral (4 acres) and oil and gas (16

acres) exploration and development. Overall, 56 acres of surface disturbance would occur within the WSA, 144 acres less than under the No Action Alternative and 16 acres more than with the All Wilderness Alternative. (Appendix 10 lists surface disturbance assumptions and estimates for the WSA.)

The analysis of the No Action Alternative, based on 200 acres of surface disturbance, shows that full development of potential resources with associated surface disturbance would not significantly affect air quality, geology, soils, vegetation, water, forest, and cultural resources. Therefore, these resources would not be significantly affected by this Partial Wilderness Alternative which assumes 56 acres of surface disturbance.

Restrictions on management and development methods within the WSA would result in essentially the same impacts on development of water sources, mineral and energy resources, wildlife, livestock grazing, and land use plans as described for the All Wilderness Alternative. The following analysis describes the differences between the Partial Wilderness, No Action, and All Wilderness Alternatives.

SOILS

It is estimated that up to 56 acres of soil could be disturbed by mineral exploration and development. Of that, 36 acres would be within the designated portion and 20 acres would be in the nondesignated area. Soil loss in the designated portion on the 36 acres would increase from 16 cubic yards/year to 112 cubic yards/year. Soil loss in the nondesignated portion on the 20 acres would increase from 9 cubic yards/year to 62 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, with this alternative, maximum annual soil loss within the designated portion would increase by approximately 96 cubic yards over current annual soil loss. Maximum annual soil loss within the nondesignated portion would increase by approximately 53 cubic yards over current annual soil loss. For the entire WSA annual soil loss would increase by 149 cubic yards (.6 percent) over the current annual soil loss of 23,662 cubic yards per year.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

The part of the WSA that would be designated wilderness would be placed in Category 4 status with no new leasing. There are 46,120 acres of post-FLPMA oil and gas leases in the area that would be designated wilderness. Activities on these leases would occur subject to the stipulations issued at the time of leasing.

It cannot be determined how much of the existing potential resource of 3 million barrels of oil and less than 18 billion cubic feet of natural gas estimated to be recoverable are within the area that would be designated as wilderness under this alternative. Assuming that the loss of potential resource recovery would be in direct proportion to the size of the area designated, exploration and development of a potential resource of up to 2.7 million barrels of oil and 16.2 billion cubic feet of natural gas could be foregone. This would allow recovery of .3 million more barrels of oil and 1.8 billion more cubic feet of natural gas than with the All Wilderness Alternative.

However, since no production is expected due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood for exploration and development activities, this alternative is not expected to result in a significant loss in recovery of the oil and gas resources.

Locatable Minerals

Uranium and Copper

Approximately 32,256 acres of mining claims are within the area that would be designated wilderness. Development work, extraction, and patenting could continue on valid claims after wilderness designation under unnecessary or undue degradation guidelines. If minerals are located prior to wilderness designation, it is estimated that up to 36 acres could be disturbed due to exploration and development of the locatable mineral resources in the portion to be designated.

The worst-case impact to minerals would occur if the potentially recoverable minerals are not within mining claims filed prior to designation. In that case the potential for recovery of up to an estimated 900 tons of uranium and 45,000 tons of copper would be foregone. After designation, all of the 46,120 acres (including claims not determined valid) would be closed to prospecting and development (USDI, BLM, 1981). The 5,320 acres not designated wilderness would remain open to mineral location and development. Assuming that the locatable minerals are evenly distributed in the WSA, this would allow for recovery of 100 more tons of uranium oxide and 5,000 more tons of copper than the All Wilderness Alternative.

Because these metals are not being recovered at present within the Mancos Mesa WSA and

because economic considerations are unfavorable, it is unlikely that exploration or development would occur. Therefore, this alternative would not significantly affect potential use of uranium and copper resources.

LIVESTOCK

Designation of 46,120 acres of the WSA as wilderness would affect livestock grazing essentially the same as with the All Wilderness Alternative. Of the 514 AUMs allocated, 435 would be within the designated portion of the WSA and 79 within the nondesignated portion. Development of future roads or other livestock management facilities for use with 435 AUMs in the designated portion could be restricted to preserve wilderness values. Because motorized vehicles are used very little in livestock management, little effect on the current management of livestock grazing is expected.

There are no existing livestock projects in the nondesignated portion. The existing range projects (two developed springs and a fence) in the recommended portion would have to be maintained with consideration given to wilderness values. The new facilities (additional reservoirs, new access routes, and a line cabin) suggested by the livestock operator would not be allowed in the designated portion, but could be installed in the nondesignated portion, if feasible, for use in that area.

VISUAL RESOURCES

Because total surface disturbance in the WSA would be 56 acres with this alternative as opposed to 200 acres with No Action and 40 acres with All Wilderness, the impact on visual resources would be less than under the No Action Alternative and slightly more than with the All Wilderness Alternative. In the portion recommended for wilderness designation, 36 acres of surface disturbance resulting from exploration and development of mining claims filed prior to designation would cause localized degradation of scenic values and exceed VRM Class I management objectives. Disturbance of a total of 36 acres within the designated portion would result in localized long-term impairment of visual values but would not significantly affect visual resources in this portion of the WSA as a whole. Disturbance related to mining claim access and exploration has already impacted visual resources to some extent in the 5,230-acre nondesignated portion on the southeast corner of the WSA. An additional 20 acres in the nondesignated portion would be disturbed and would not meet VRM Class II objectives. This would add to but not significantly change the existing disturbed conditions there.

RECREATION

Impacts on recreational values and opportunities for the 46,120-acre area that would be designated as wilderness would be as described in the All Wilderness Alternative. Approximately 6 miles of ways within the designated part of the WSA would be closed to ORV use. However, little impact on ORV recreational use would be expected due to the lack of such activity in the area.

In the 5,320-acre area that would not be designated, about 19 miles of ways would remain open and little change in recreational use is expected. Most existing ORV use occurs in that area and primitive recreational values there are limited.

As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an increase in primitive recreational use above the baseline rate. Within the portion designated wilderness, primitive recreation use could increase to an estimated 4,600 visitor days/year. Management provided through a Wilderness Management Plan would prevent destructive increases in future recreation use, and due to the size and configuration of the WSA, the quality of the primitive recreation experience probably would not be negatively affected by the increased use. The estimated 149 visitor days of ORV play activity (mostly motorcycle use) in the nondesignated portion of the WSA could continue to occur. Because very little of the ORV use occurs in the 46,120-acre area, ORV use would not decline in the vicinity of the WSA.

The existing commercial recreation uses would benefit as a result of wilderness designation. As recreation use increases, other commercial operations based on primitive recreational activities could apply for use of the WSA. Visitor days of commercial use would be about the same as for the All Wilderness Alternative, inasmuch as the 46,120 acres that would be designated contain all of the wilderness values desired by the user groups. The nondesignated area for this alternative does not have these values and, therefore, does not attract the commercial use.

WILDERNESS VALUES

Impacts to wilderness values would be the same as under the All Wilderness Alternative on the 46,120 acres that would be designated wilderness. Naturalness would be enhanced by restrictions on surface-disturbing activities and motorized vehicles. Size, naturalness (all 46,120 acres

are natural), outstanding opportunities for solitude and primitive recreation, and special features (on 46,120 acres) would be preserved.

Nonmotorized recreational uses of the WSA such as hiking and camping would probably increase due to public awareness of the WSA through wilderness designation. This increased use is not expected to substantially decrease opportunities for solitude because of the large size of the unit, adjacent Glen Canyon NRA lands proposed for wilderness, and the screening afforded by the diverse topographic features.

Approximately 46,120 acres of desert bighorn sheep crucial habitat would be preserved. Ten of the 13 recorded cultural sites and 1,075 of the estimated 1,206 potential sites would receive additional protection from wilderness designation, as would the outstanding scenic values.

Within the designated portion of the WSA, the anticipated 36 acres of mineral-related surface disturbance for development of valid mining claims could impact wilderness values. Mitigation to minimize impacts to wilderness values would be considered during mining claim development. Although disturbance would eliminate solitude and naturalness in the vicinity of the activity, it is less likely that a significant loss of solitude and naturalness would occur than with the No Action Alternative.

In the 5,320-acre area that would not be designated, there would be an estimated 20 acres of disturbance from mineral and energy exploration and development activities. Those activities would degrade wilderness values from the commencement of activities through rehabilitation; however, in this area, the naturalness, solitude, and primitive recreation attributes are already relatively low. Nondesignation would not protect the 5,320 acres of desert bighorn sheep crucial habitat. The three recorded archaeological sites and 131 potential sites in the nondesignated area would be protected by normal cultural resource provisions and laws but would not have additional wilderness protection. Scenic values would receive VRM Class II protection. Thus, slight long-term impairment of wilderness values in the portion that would not be designated would be expected. Additionally, the sights, sounds, and emissions possible from mineral and energy activities could impair solitude and primitive recreation values in the portion that would be designated.

LAND USE PLANS AND CONTROLS

This alternative would relate to the Land Use Plans and Controls section as described for the All Wilderness Alternative, except it would affect 46,120 acres instead of 51,440 acres. Wilderness designation would be inconsistent with the County's multiple-use concept which portrays a open range and forest land. Wilderness designation would constitute an amendment to the BLM South San Juan MFP and/or the San Juan RMP scheduled for completion in 1986. The 5,320 acres not designated would be consistent with land use plans as described for the No Action Alternative. Partial designation would not complement the NPS-proposed wilderness designation in the portion of the Glen Canyon NRA adjacent to the WSA.

SOCIOECONOMICS

Overall there would be no significant changes in current trends of population, employment, and local income distribution.

The only socioeconomic differences between this alternative and the other two alternatives relate to changes in oil and gas leasing, mining claims, and recreation. Income related to livestock would be essentially as described for the All Wilderness Alternative.

The loss of 46,120 acres now leased in the portion to be designated would cause an eventual loss of up to $138,360 per year of lease fees to the Federal Treasury. A potential for $15,960 annually in Federal revenues could continue to be attained from the 5,320 acres from oil and gas leases in the portion not designated wilderness.

The $100 per year of mining claim assessment could continue on valid claims within both the designated and the nondesignated portions of the WSA. Within the 5,320 acres not designated, new claims could be located in the future, each with the associated $100 per year of due assessment income to the local economy. New claims and assessment income in the 46,120-acre designated area would be foregone.

Primitive recreation use as a result of wilderness designation would create an annual local income of an estimated $18,860 and up to $50,000 income to commercial recreation outfitters.

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Grand Gulch Complex

GRAND GULCH COMPLEX
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GRAND GULCH COMPLEX

INTRODUCTION

General Description of the Area

The Grand Gulch Instant Study Area (ISA) consists of the existing Grand Gulch Primitive Area (37,580 acres). Contiguous with that area are the Pine Canyon Wilderness Study Area (WSA) (10,890 acres), Bullet Canyon WSA (8,520 acres), Sheiks Flat WSA (3,140 acres), and Slickhorn Canyon WSA (45,390 acres). The ISA and the four WSAs total 105,520 acres of public land. For ease of reference, the entire area is referred to in this document as the Grand Gulch Complex, ISA Complex, Complex, or ISA. Variations in reported acreage between this document and the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980) are due to recomputations for more accurate measurement methods in this Environmental Impact Statement (EIS). Four State Sections (2,400 acres) are within the boundaries but not included in the ISA Complex. The unit is located in San Juan County, Utah about 45 miles west-southwest of Blanding.

Generally the ISA Complex is bounded by the historic Hole-in-the-Rock Trail on the north, the Glen Canyon National Recreation Area (NRA) on the south, and a combination of roads and legal subdivisions on the east and west. This forms a configuration that is about 19 miles north to south and 16 miles east to west. The excluded "cherry-stemmed" Polly's Mesa loop road intrudes into the center of this configuration.

The ISA Complex is composed of three major canyons: Grand Gulch, Slickhorn, and John's along with their tributaries and sloping mesas.

Grand Gulch itself meanders over 53 miles to cover a distance of perhaps 21 air miles. It is a major tributary canyon of the San Juan River. The creek bed is 400 to 600 feet deep, enclosed by sheer red rock cliffs, overhangs, arches, knobs, and alcoves. Ancient Indian cliff dwellings are tucked among ledges on the cliffs, and pictographs are found in numerous places within the canyon system.

The desert canyon system in the Grand Gulch Complex creates a network of canyons over 190 miles in total length. Some of these canyons rival Grand Gulch in depth. Grand Gulch is joined by Kane Gulch near its head. Also grouped near the head along the next several miles are Long, Todie, Coyote, and Sheiks Canyons. Bullet Canyon, a major canyon with cliff dwellings and a popular hiking route into Grand Gulch, enters a few miles south of Sheiks Canyon. Where Bullet meets Grand Gulch, both canyons are nearly 600 feet deep and only .50 mile wide. In the next 16 miles Grand Gulch is joined by seven tributaries, each offering interesting exploring possibilities to recreationists. The most significant of these canyons is Polly's Canyon, which enters The Gulch at Polly's Island. The walls of this canyon are sheer, sometimes overhanging in the lower few miles, terraced near the junction of its two forks. They narrow considerably in the upper forks before finally reaching the plateau of Polly's Mesa.

Below the junction with Collins Canyon, Grand Gulch is joined by a maze of at least ten unnamed canyons.

Slickhorn Canyon is about 9 miles long through the unit, continuing 3 miles through Glen Canyon NRA to the San Juan River. It is over 700 feet deep at the Glen Canyon NRA boundary and 400 feet deep in the upper ends. The canyon is narrow throughout its entire length, with sheer sandstone walls in places and broken walls with only short vertical faces in other areas. Boulders, cottonwoods, and scrub oak are found in the narrow meandering canyon bottom.

The complex of drainages in the upper half of John's Canyon contrasts sharply with the wide open valley of lower John's Canyon. The upper canyons are narrow with pinyon, juniper, oak, shrubs, slickrock, and some pouroffs.

STATEWIDE POCKET MAP NO. 46 SEE VOL. I

Annual precipitation ranges from 8 inches to 14 inches in the ISA Complex. January, May, and June are the driest months. July, August, and December are the wettest months. Annual total snowfall ranges from 10 to 40 inches. The intense rainfalls and large expanses of slickrock in the ISA Complex produce rapid runoff and flash floods. Depending on elevation the average annual temperature is 51 to 57 degrees Farenheit (F); the average annual low temperature is 37 to 43 degrees F and the average annual high temperature is 65 to 71 degrees F.

Specific Issues Identified in Scoping

Issues and concerns specific to this ISA Complex include the interaction of the most prominent resources and uses: archaeology, recreation, grazing, and minerals.

General issues pertaining to more than the Grand Gulch ISA Complex are discussed in Volume I. Issues and concerns raised in public scoping (USDI, BLM, 1984) and specific to the Grand Gulch ISA Complex are responded to below:

1. *Comment:* This is a high erosion area and portions of the unit could receive erosion control measures. It should not, therefore, be designated wilderness.

   Response: The effects of wilderness designation and nondesignation on soil erosion are discussed in the Soils sections of this document. Under current conditions, soil erosion rates within this ISA Complex are considered to be low. There are no watershed treatments in the ISA Complex and none are currently planned. Surface disturbance could increase the erosion rates in the area dramatically. Wilderness designation would benefit soils by limiting surface-disturbing activities.

2. *Comment:* What would the effect of wilderness designation be on potential oil and gas development and oil and gas leases?

   Response: The ISA Complex has 49 oil and gas leases (60,260 acres) on Federal lands. As discussed in the Mineral and Energy Resources sections of this document, leases on 53,040 acres could be developed under stipulations issued at the time of leasing; these stipulations had no wilderness considerations. Leases on 7,220 acres could only be developed in a manner nonimpairing to wilderness values. These leases would probably expire without development. Since the potential for oil and gas resources within the ISA Complex is low, it is probable that these leases would expire without development, and new leases would not be issued. Under wilderness designation, the opportunity to recover up to as much as 3 million barrels of oil and 18 billion cubic feet of gas could be foregone.

3. *Comment:* Parcels of the ISA Complex have potential for vegetation manipulation for mule deer winter range. Total designation would prevent manipulation.

   Response: As noted in the Affected Environment, Wildlife section, no potential vegetation manipulation projects have been identified or planned.

4. *Comment:* The canyon rims and mesa areas are valuable wood-gathering areas for neighboring tribes.

   Response: Use of the ISA Complex for firewood is discussed in the Affected Environment, Forest Resources section. In 1981, 323 free-use firewood permits were issued in the San Juan Resource Area. Some were probably utilized in the Cedar Mesa area. However, it is unlikely that many individuals gather firewood from within the ISA Complex. Most firewood cutting now taking place on Cedar Mesa occurs adjacent to roads and ways outside the ISA Complex.

5. *Comment:* This area contains archaeological sites that should be protected by wilderness designation.

   Response: The effects of wilderness designation and nondesignation on archaeological sites are discussed in the Cultural Resources portions of this document. Overall, wilderness designation would benefit cultural resources through limiting the amount of surface-disturbing activities.

6. *Comment:* Grand Gulch, Slickhorn, and John's Canyons have outstanding wilderness characteristics, abundant opportunities for solitude and recreation, and no intrusions or resource conflicts.

   Response: The wilderness characteristics of the ISA Complex are discussed in the Affected Environment, Wilderness Values section. The entire 105,520 acres meet the naturalness criteria for areas under wilderness review. Imprints of man within the area include rangeland improvements (i.e., fences, reservoirs, developed springs) and vehicular ways. These are not substantially noticeable

in the ISA Complex as a whole. The entire ISA Complex has outstanding opportunities for primitive and unconfined recreation, and 103,920 acres have outstanding opportunities for solitude. As discussed in the Environmental Consequences of Alternatives section, resource conflicts with wilderness designation would be minimal.

7. *Comment:* There are several vehicular ways and "cherry-stemmed" roads in the area that show man's imprint.

Response: There are approximately 30 miles of existing vehicular ways in the ISA Complex, about 5 miles of "cherry-stemmed" roads, and approximately 23 miles of paved and unpaved roads bordering the unit. Also, refer to the response to the previous comment.

8. *Comment:* There are stockwatering ponds and range improvements in this ISA Complex that show man's imprint.

Response: Refer to the responses to the previous two comments.

9. *Comment:* Sounds from Highway U-263 can be heard in many parts of the area.

Response: As discussed in the Affected Environment, Wilderness Values section, approximately 800 acres within the Pine Canyon WSA portion of this ISA Complex are adjacent to Highway U-263. Motorized travel on this route limits the opportunities for solitude.

10. *Comment:* Would wilderness designation be consistent with local and State land use planning?

Response: As discussed in the Land Use Plans and Controls sections of this document, the *San Juan County Master Plan* predates wilderness considerations. State sections within any designated portion of the area would be exchanged; therefore, there would be no impact to the State's plans.

11. *Comment:* How would wilderness designation impact private and State in-holdings?

Response: State in-holdings would be exchanged (refer to Volume I). There are no private in-holdings in this ISA Complex.

12. *Comment:* The boundary on the western side of Grand Gulch follows section lines. Any wilderness proposal to Congress ought to have boundaries on roads or other identifiable ground features.

Response: The boundary on the west side of the ISA Complex is the same as now exists for the Grand Gulch Primitive Area. It is used for the wilderness boundary because the primitive area is a mandated ISA.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated From Detailed Study

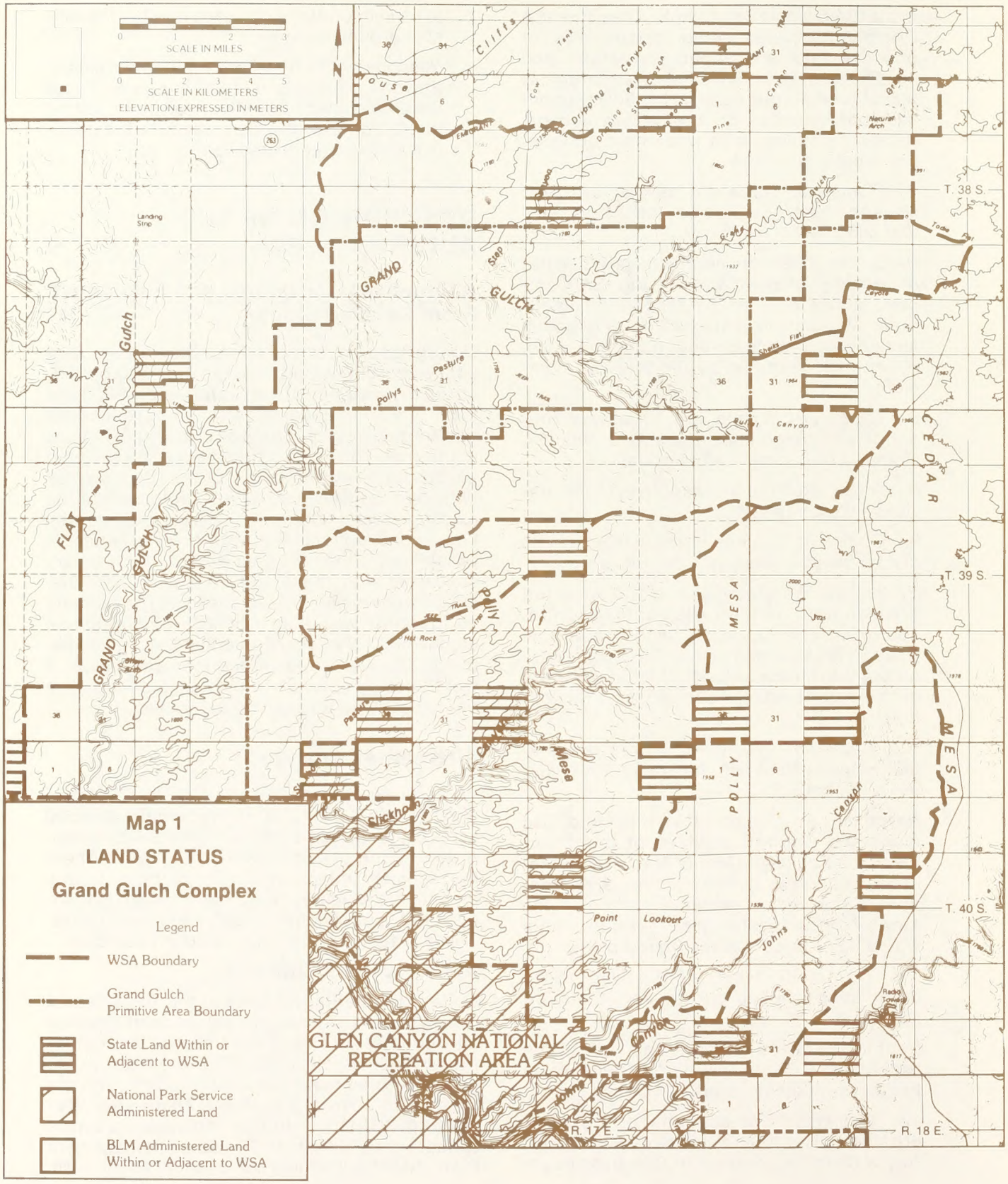
During scoping, two additional alternatives were suggested. One would have expanded the boundary on the west side of the Grand Gulch ISA Complex. The other suggestion would have focused an alternative on important archaeological values in the area. The first suggestion was not adopted because the west boundary of the ISA Complex (which is the same as the west boundary of the existing Grand Gulch Primitive Area) is well known and well marked, with few management problems. Further, the area west of the boundary is scarred with roads and trails and, therefore, lacks wilderness characteristics. The second suggestion was also not adopted because archaeological values of potential National Register quality are found throughout the region. It would not be possible to develop an alternative based solely on archaeological values.

Alternatives Analyzed

Three alternatives are analyzed for this ISA Complex: (1) No Action; (2) All Wilderness (105,520 acres); and (3) Partial Wilderness (37,580 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 105,520-acre Grand Gulch ISA Complex would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the South San Juan Management Framework Plan (MFP) (USDI, BLM, 1971) until that plan is superseded by the San Juan Resource Management Plan (RMP) scheduled for completion in 1986.



Map 1

LAND STATUS

Grand Gulch Complex

Legend

- WSA Boundary
- Grand Gulch Primitive Area Boundary
- State Land Within or Adjacent to WSA
- National Park Service Administered Land
- BLM Administered Land Within or Adjacent to WSA

The State land within the ISA Complex (refer to Map 1) has not been identified in the MFP for special Federal acquisition through exchange or purchase. Refer to Volume I for further information on State in-holdings.

The following are specific actions that would take place under this alternative:

- The ISA Complex would remain open to mineral location and sale with the exception of the Grand Gulch Primitive Area (37,580 acres) which is closed to mineral location and sale. No mining claims are located in the ISA Complex. Development work, extraction, and patenting would be allowed on future mining claims and would be regulated by unnecessary or undue degradation regulations (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases (60,260 acres) could be developed under stipulations issued at time of leasing. Future leases could be developed under leasing Category 2 (special stipulations) on 41,172 acres and Category 3 (no surface occupancy) on 15,165 acres. Some 49,183 acres (including the 37,580-acre Grand Gulch Primitive Area) would be closed to oil and gas leasing (Category 4). Approximately 3,923 acres of existing oil and gas leases would expire and would not be reissued in order to meet Category 4 restrictions.
- The present domestic livestock grazing use (currently 1,930 Animal Unit Months [AUMs]) in the ISA Complex would continue as authorized in the MFP. Access to and use of the existing range developments (12 reservoirs, several seedings totaling 1,900 acres, three spring developments, and several miles of fence) would continue. New rangeland developments (including seven reservoirs, one spring development, and 2.5 miles of water pipeline) would be allowed without wilderness considerations. Approximately 4,680 acres of planned vegetation treatments would also be allowed.
- Developments for wildlife, water resources, etc., could be allowed if in conformance with the MFP; however, no developments other than those listed for livestock are currently planned in the ISA Complex.
- The ISA Complex would be open to off-road vehicle (ORV) use and new access routes for development could be allowed with the exception of the Grand Gulch Primitive Area (37,580 acres) which would remain closed to ORV use. There are approximately 15 miles of ways in the Grand Gulch portion that would remain closed and 15 miles of ways in the remainder of the ISA Complex that would remain open.
- The ISA Complex would be open to woodland product harvest with the exception of the Grand Gulch Primitive Area. There is minimal harvest of forest products at the present time.
- The area would continue to be managed under Visual Resource Management (VRM) Class I (37,580 acres), Class II (20,140 acres), Class III (32,400 acres), and Class IV (15,400 acres).
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Ranger patrols, including helicopter use, would continue for the purpose of controlling vandalism in the area.
- Hunting would be allowed subject to applicable State and Federal laws and regulations but without the use of motorized vehicles in the 37,580-acre Primitive Area portion.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.
- Under the No Action Alternative, it is assumed that the existing Grand Gulch Primitive Area would not continue as a designated Primitive Area. It would, however, be considered for other special designation (e.g., Outstanding Natural Area [ONA] or Area of Critical Environmental Concern [ACEC]). It is assumed that current management actions (e.g., closure to mineral leasing and location and ORV use) and the VRM Class I designation

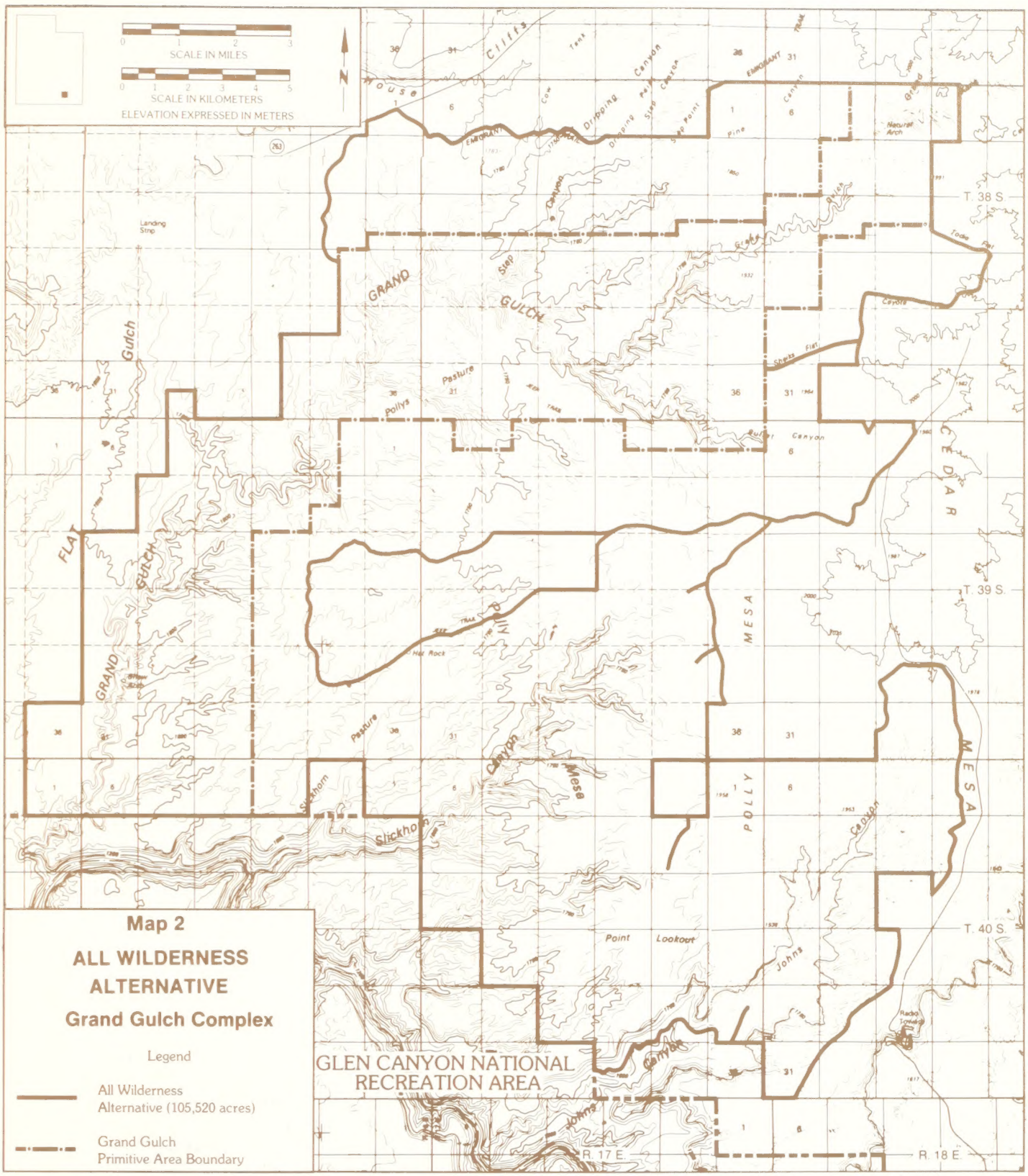
would continue. Management of the Primitive Area under another special designation would be a separate action that is not dependent on the wilderness review process and is not discussed further in this wilderness document except as current management characteristics are integrated with the No Action Alternative.

ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under this alternative, all 105,520 acres of the Grand Gulch ISA Complex would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. Upon designation, acquisition of about three sections of State land (1,920 acres) within the ISA Complex (refer to Map 1) would be likely and could be authorized by purchase or exchange. In addition, six adjacent State sections (3,680 acres) could be acquired (refer to Appendix 3). Seven other State sections adjacent to the ISA Complex likely would not be exchanged. Should land transfers be made, it is assumed that management and types of impacts to former State inholdings would be the same as those on adjacent Federal lands, and no specific analysis is given here. The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located within the ISA vate or split estate lands are located in the ISA Complex.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 105,520 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Currently, no mining claims are located in the ISA Complex. Should any be located prior to wilderness designation, development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809) with consideration given to wilderness values. Existing oil and gas leases involving 60,260 acres would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.
- Present domestic livestock grazing would continue as authorized in the South San Juan MFP. The 1,930 AUMs in the ISA Complex would remain available to livestock as presently allotted. Use and maintenance of rangeland developments existing at the time of designation would continue in the same manner as in the past based on practical necessity and reasonableness. These developments include 12 reservoirs, several seedings totaling 1,900 acres, three spring developments, and several miles of fence. It is assumed that, after designation, new rangeland developments would be allowed if necessary for the protection or effective management of the rangeland and/or wilderness resource and if they can be carried out consistently with wilderness protection standards (refer to Appendix 1). The currently proposed 2.5 miles of water pipeline and spring development would probably be allowed. The approximately 4,680 acres of planned land treatments and the seven planned reservoirs would not be allowed under this alternative.
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if compatible with wilderness values, if needed to correct an imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or watershed treatments other than those listed for livestock are located in the Grand Gulch ISA Complex, and none are planned.
- Wildlife transplants or developments would be allowed after designation if compatible with wilderness values. None are now existing and none are planned.
- The entire ISA Complex would be closed to ORV use except for: (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) for occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. About 30 miles of existing vehicular ways in the ISA Complex would not be available for vehicular use except as indicated above. The approximately 23 miles of paved and unpaved roads and trails that border the ISA Complex and approximately 5 miles of "cherry-stemmed" roads would remain open to vehicular use.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 105,520-acre wilderness. As part of that plan, it is assumed that a


SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
T. 38 S.
T. 39 S.
T. 40 S.
R. 17 E.
R. 18 E.
GRAND GULCH
FLAT
GRAND GULCH
Gulch
CEDAR MESA
POLLY MESA
Canyon
Mesa
Pasture
Landing Strip
Point Lookout
GLEN CANYON NATIONAL RECREATION AREA
Map 2
ALL WILDERNESS ALTERNATIVE
Grand Gulch Complex
Legend
All Wilderness Alternative (105,520 acres)
Grand Gulch Primitive Area Boundary

maintenance-and-use border would be allowed along roads that are adjacent to or "cherry-stemmed" into the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface. Ranger patrols, including use of helicopters, would be addressed in the Plan. It is assumed that such use would be continued in the wilderness area for the purpose of controlling vandalism.

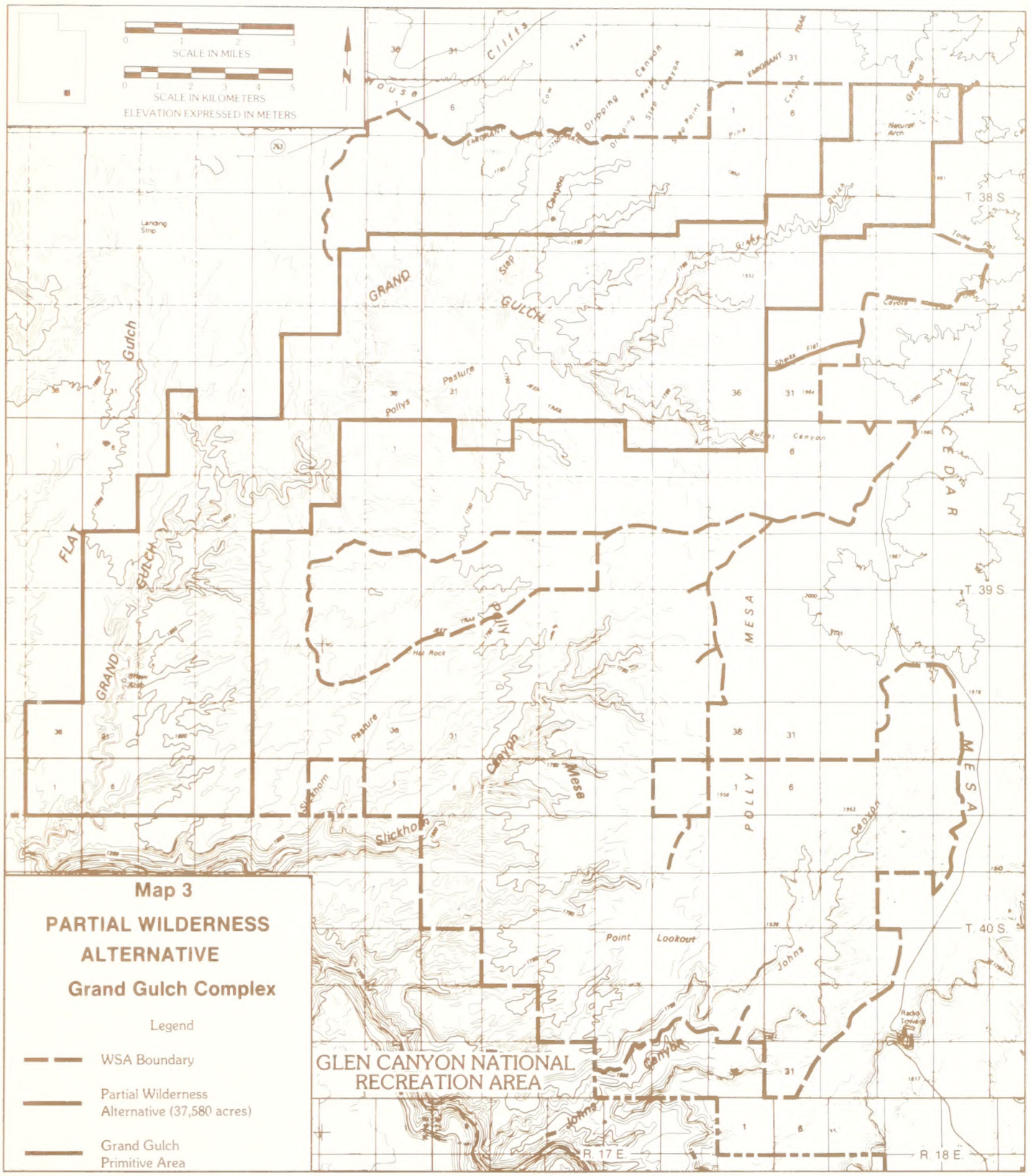
- Harvest of forest products would not be allowed except for harvest of pinyon nuts or noncommercial gathering of dead-and-down wood if accomplished by other than mechanical means. There is minimal harvest of forest products at the present time.
- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. It is assumed that firefighting would be limited to hand and aerial methods.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

PARTIAL WILDERNESS ALTERNATIVE

Under this alternative, 37,580 acres of the Grand Gulch ISA Complex would be designated as wilderness (refer to Map 3). The objective of this alternative is to analyze as wilderness that portion of the ISA Complex with the most outstanding wilderness characteristics. This alternative essentially consists of the Grand Gulch Primitive Area. The remaining 67,940 acres in the ISA Complex would be managed in accordance with the South San Juan MFP, as described for the No Action Alternative. The 37,580 acres designated as wilderness would be managed in accordance with the BLM "Wilderness Management Policy," as described in the All Wilderness Alternative. No State or private lands are located in the area that would be designated wilderness under this alternative. One of three State sections adjacent to the area probably would be exchanged. Should land transfers be made, it is assumed that management and types of impacts would be the same as those on adjacent Federal lands and no specific analysis is given here. The figures and acreages given under this alternative are for Federal lands only. (Refer to Volume I for further information regarding State in-holdings.)

A summary of specific actions under this alternative follows.

- The 37,580-acre wilderness would continue to be closed to mineral entry, leasing, and sale. There are no mining claims or leases located in the area. The 67,940 acres not designated wilderness would be open to mineral location and sale. Development work, extraction, and patenting of future mining claims (none currently exist) could occur if the claims are valid. Development of existing oil and gas leases (60,260 acres) and future leases could occur without concern for wilderness values. The area not designated wilderness would be managed as oil and gas leasing Category 2 (special stipulations) on 41,172 acres and Category 3 (no surface occupancy) on 15,165 acres. Approximately 11,603 acres would be in Category 4 (no leasing). Approximately 3,923 acres of existing oil and gas leases would expire and would not be reissued in order to meet Category 4 restrictions.


SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
Map 3
PARTIAL WILDERNESS ALTERNATIVE
Grand Gulch Complex
Legend
WSA Boundary
Partial Wilderness Alternative (37,580 acres)
Grand Gulch Primitive Area
GLEN CANYON NATIONAL RECREATION AREA
GRAND GULCH
FLAT GULCH
GRAND Gulch
CEDAR MESA
POLLY MESA
Cliffs
Step Canyon
Dripping Spring Canyon
Pollys Pasture
Hat Rock
Stickhorn Canyon
Point Lookout
Johns Canyon
Sheiks Flat
Natural Arch
Landing Strip
T. 38 S.
T. 39 S.
T. 40 S.
R. 17 E.
R. 18 E.

- Domestic livestock grazing would continue as authorized in the South San Juan MFP. The current 259 AUMs of use in the wilderness area would continue. In the wilderness portion there are one existing reservoir, one existing spring development, and 0.3 mile of fence that could continue to be used and maintained in the same manner as in the past based on practical necessity and reasonableness. Range developments would be allowed after designation only if necessary for the protection and effective management of the rangeland and/or wilderness resources, and if wilderness protection criteria are met. The 1,080 acres of land treatments and the six reservoirs proposed in the 37,580-acre wilderness would not be allowed. Construction of the 0.3 mile of pipeline proposed in this area probably would be allowed. In the 67,940-acre nonwilderness area, current grazing use of 1,671 AUMs and maintenance of existing improvements would also continue as authorized in the MFP. The 3,600 acres of proposed land treatments and the proposed developments (one reservoir, one spring development, and 2.2 miles of proposed pipeline) would be allowed without wilderness considerations.
- In the 37,580-acre wilderness, new water resource facilities or watershed activities (other than range developments) would be allowed only if compatible with wilderness, needed to correct imminent hazards to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act*. In the 67,940-acre nonwilderness area, water resource developments would be allowed if in accordance with the MFP. None are now planned.
- In the wilderness area, wildlife transplants or habitat improvements would be allowed only if compatible with wilderness values. In the nonwilderness area, wildlife transplants or improvements would be allowed if in accordance with the MFP without consideration for wilderness values. None are now planned in either the wilderness or nonwilderness areas of the ISA Complex.
- The 37,580-acre wilderness would continue to be closed to ORV use. The remainder of the unit would remain open to vehicular travel. About 15 miles of existing vehicular ways within the wilderness portion would continue to be closed to vehicular use except for purposes identified under the All Wilderness Alternative. The undesignated area would remain open to vehicular use. The 15 miles of ways in this portion could continue to be used for motorized access.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 37,580-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface. The Plan would address ranger patrols including helicopter use. Such use would be continued in the wilderness area to control vandalism.
- Harvest of forest products in the wilderness area would not be allowed except for harvest of pinyon nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. The area not designated wilderness would be open to woodland harvest.
- Visual resources in the wilderness area would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change. The area not designated as wilderness would be managed as VRM Class II (20,140 acres), Class III (32,400 acres), and Class IV (15,400 acres).
- Within the wilderness area, measures to control fire, insects, noxious weeds, or disease would be taken only in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. It is assumed that firefighting would be by hand or aerial means. In the area not designated, measures of control would be taken without wilderness considerations.
- In the nonwilderness area, any activity for the purpose of gathering information about natural resources would be allowed by permit. In the wilderness area, such activity would be allowed by permit if compatible with wilderness preservation. It

would be limited to that conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.

- In the nonwilderness area, hunting would be allowed subject to applicable State and Federal laws and regulations but limited to nonmotorized means.
- In the nonwilderness area, control of predators would be allowed to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. In the wilderness area, control of predators would be allowed for the same purposes, but only under conditions that would ensure minimum disturbance to wilderness values. Poison baits or cyanide guns would not be allowed.

Summary of Environmental Consequences

Table 1 summarizes the main environmental impacts that would result from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Air Quality

The closest air monitoring station to the ISA Complex is 35 miles west at Bullfrog Marina on Lake Powell. Particulate and sulfur dioxide concentrations are measured.

Only the short-term (24-hour) particulate standard has been exceeded at the Bullfrog station. The 24-hour violations were probably associated with conditions of high winds and blowing dust (resulting from the scarce vegetation and large areas of exposed sand).

Generally the air quality is very good over the ISA Complex, allowing for long vistas where topography or vegetation screening are not limiting. Visual range in the general vicinity averages between 100 to 132 miles during the summer (Aerocomp, Inc., 1984).

The ISA Complex is in a Prevention of Significant Deterioration (PSD) Class II area under the provisions of the Clean Air Act, as amended. This classification allows for moderate increases in air pollution levels. The Department of Interior did recommend to Congress on September 7, 1979, pursuant to Section 164(d) of the Clean Air Act Amendment of 1977, that the Grand Gulch Primitive Area had air quality related values as important attributes of the area worthy of redesignation to Class I air quality. No action has been taken on this recommendation by the State of Utah.

The closest PSD Class I area is Canyonlands National Park, approximately 30 air miles away.

Geology

The ISA Complex is within the Canyonlands section of the Colorado Plateau Physiographic Province. This section is the most rugged and least accessible of the province and is characterized by bare rock surfaces, plateaus, and steep-walled canyons.

The geology of the ISA Complex is quite simple from the standpoint of the number of geologic formations which are exposed. It is almost all cut into the Cedar Mesa Sandstone Member of the Cutler Formation of Permian Age (225 to 280 million years). Only the lower 1.5 miles of Grand Gulch have cut into older rocks of the Halgaito Shale Member of the Cutler Formation and the Honaker Trail Formation of Pennsylvanian Age (280 to 320 million years).

The thick sandstone forms the broad surface of Cedar Mesa, covering about 350,000 acres north of the San Juan River. The ISA Complex sits adjacent to the crest of a broad, uplifted area known as the Monument Upwarp, which has a north-south axis and extends east to west from Comb Ridge to Clay Hills. The Monument Upwarp was probably formed during the Laramide Orogeny (65 million years ago).

The Cedar Mesa Sandstone appears to be essentially horizontal, but it does dip gently to the south and west at 13 degrees. In most places throughout Grand Gulch, the stream has probably cut almost through the Cedar Mesa Sandstone. The present gradient of the stream is very close to the south and west dip of the sandstone.

The Cedar Mesa Sandstone is about 800 feet thick and was deposited approximately 250 million years ago in a near shore marine environment. A shallow evaporate marine basin occurs to the east, as the Cedar Mesa Sandstone grades into a rock containing more gypsum in the Comb Ridge area.

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
GRAND GULCH COMPLEX

Resource	Alternatives		
	No Action	All Wilderness (105,520 Acres) (Proposed Action)	Partial Wilderness Designation (37,580 Acres)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 1.6 million barrels of oil and 9.5 billion cubic feet of natural gas.	Oil and gas likely would not be recovered but, due to the low likelihood of recovery, the loss of development opportunity would not be significant.	Effects would be the same as with the No Action Alternative.
Wildlife	Less than 0.1 percent of the ISA could be affected by mineral and energy development, which could adversely affect wildlife habitat. Wildlife would benefit in the long term from the proposed land treatment on 4.4 percent of the ISA.	Wildlife would benefit from solitude. The proposed land treatment would not be allowed, and benefits to wildlife would not occur.	Wildlife would benefit from solitude and land treatment on 3.4 percent of the ISA.
Livestock	Grazing of 1,930 AUMs and maintenance of existing developments would continue. Proposed new developments, consisting of seven reservoirs, one spring development, 2.5 miles of pipeline, and 4,680 acres of land treatments could be implemented to produce 1,118 additional AUMs.	Grazing of 1,930 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. Proposed new developments might not be allowed. The land treatment would not be allowed and the opportunity for 1,118 additional AUMs would be lost.	Grazing of 1,930 AUMs and maintenance of existing developments would continue. One reservoir, one spring development, 2.5 miles of pipeline, and 3,600 acres of land treatments could be allowed. An additional 860 AUMs would be produced.
Visual Resources	The quality of visual resources could be impaired on up to 4,765 acres.	Visual quality would not be impaired, as mineral-related activities and land treatments would not occur.	Visual quality could be impaired on up to 3,685 acres in the nondesignated portion. About 66 percent of the Class A scenery would be within the designated portion and would be protected by the reduced potential for disturbance.
Recreation	ORV use would continue on 15 miles of ways at current low levels. Another 15 miles of ways would remain closed to ORV use. Overall recreational use could increase from the present 20,000 visitor days per year to 29,818 over the next 20 years. Up to 85 acres of mineral-related disturbance and 4,680 acres of land treatment could reduce the quality of primitive recreation.	The ISA, including 30 miles of ways, would be closed to ORV use. Recreational use could increase to up to 31,656 visitor days over the next 20 years due to publicity associated with wilderness designation.	ORV recreational use could continue on 15 miles of ways in the undesignated portion. Visitation would be about the same as with the No Action Alternative.

TABLE 1 (CONTINUED)
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
GRAND GULCH COMPLEX

Resource	Alternatives		
	No Action	All Wilderness (105,520 Acres) (Proposed Action)	Partial Wilderness Designation (37,580 Acres)
Wilderness Values	Wilderness values could be lost on up to 4,765 acres (4.5 percent of the ISA).	Wilderness values would be protected, as the ISA would not be affected by mineral-related disturbance or land treatments.	Wilderness values would be protected in the designated area. Impairment from mineral-related activities and land treatments could occur on 5.4 percent of the 67,940 acres not designated. Overall, wilderness values could be lost on 3.5 percent of the ISA. Only about 36 percent of the area meeting the standards for naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive recreation would be in the designated portion and would be protected by reduced potential for disturbance.
Land Use Plans and Controls	This alternative would generally be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the current BLM South San Juan MFP. It would not complement the NPS proposal for nearby wilderness. Continuation of closure to mineral sales, leasing, location and development on 37,580 acres would not be consistent with the county's multiple-use concept.	This alternative would not be consistent with San Juan County's concept of multiple use. It would be consistent with State policy if lands were exchanged, and would complement the NPS proposal for wilderness. Designation would constitute an amendment of the BLM South San Juan MFP.	Partial designation would be the same as the No Action Alternative. Although lands would not be exchanged, this alternative would not conflict with State policy.
Socio-economics	Annual local sales of less than $122,000 would continue. Federal revenues would be reduced by $11,769 per year from the current $184,982 due to phasing out of existing oil and gas leases to meet Category 4 restrictions. Additional forage from land treatment might increase local benefits by up to $22,360 and Federal grazing revenues by $1,565.	Annual local sales of less than $122,000 and Federal revenues of up to $2,702 would continue, but Federal revenues of up to $169,011 from mineral leasing (as allowed with No Action) and local benefits and Federal receipts from additional grazing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the ISA, but increased recreational use over the next 20 years might result in local sales of up to $129,790.	The effects of this alternative would be the same as for the No Action Alternative, except that local sales from grazing and Federal revenues might be increased by up to $17,200 and $1,204, respectively, as a result of land treatments.

The canyons are geologically young and have probably been cutting into Cedar Mesa Sandstone since only late Tertiary time (about 20 million years ago). This is when the entire Colorado Plateau began a period of uplift to its present form. Initial downcutting of the canyons must have been fairly rapid because much of the original meandering character of the stream is still present.

The topography of the ISA Complex is generally divided into two types: mesas and canyons. The mesas generally dip to the south and west with elevations ranging from 6,400 feet in the northeast to 4,800 feet in the southwest. This elevation change occurs over a straight line distance of about 21 miles. Hills and ridges on the mesas range up to about 200 feet providing topographic relief. There are three major canyons within the ISA Complex: Grand Gulch, Slickhorn, and John's, all of which drain into the San Juan River.

Grand Gulch is the most significant of these canyons as it meanders for about 53 miles (2 miles within Glen Canyon NRA) over a straight line distance of about 21 miles. Within its 400- to 600-foot canyon, erosion has further cut a 10- to 20-foot deep path through alluvial fill. Waterfalls occur at outcroppings of resistant rock, and the sandstone canyon walls have so many overhangs that entrance into the canyon without ropes is possible at less than a dozen places in its 53-mile length. These overhangs provide numerous sheltered alcoves. The erosion of the sandstone has also created a couple of natural arches, several rincons, and numerous pinnacles.

Including side canyons, such as Bullet, Kane, Polly's, Collins, Step, and Pine, there are about 150 miles of canyons in the Grand Gulch drainage (inside the ISA Complex). These side canyons exhibit many of the same characteristics of Grand Gulch, although canyon depths are generally not as great.

Slickhorn Canyon is a 300- to 800-foot deep, narrow, gently meandering canyon, with several smaller tributaries branching from the east of the main canyon. From the extreme upper reaches, Slickhorn winds its way more than 12 miles (3 miles within Glen Canyon NRA) to the San Juan River. Tributaries add another 13 miles of canyons to this system. Unique erosional features, including arches, delicately balanced rocks, towering pinnacles, and vertical sandstone walls are found throughout the entire length of the canyon. A 100-foot pouroff prohibits access into Slickhorn from the northern-most branch canyon; however, access of varying degrees of difficulty may be found in most of the other canyons to the east. Most of Slickhorn Canyon and its tributaries are strewn with boulders.

In contrast to the narrow, boulder-strewn Slickhorn Canyon, John's Canyon, specifically the lower portion, has a broad, flat alluvial bottom cut by a gently meandering arroyo. Canyon walls, although over 800 feet high, are diminished in apparent size due to the 1-mile-wide canyon floor. Towering pinnacles, balanced rocks, and other similar erosional features are not evident in the lower portion of John's. Instead, 800- to 1,000-foot buttes, with steep talus sloping away from vertical walls, line the canyon's internal boundaries.

The upper half of the canyon consists of numerous, deep, narrow canyons, branching out to the north and northeast, much in the shape of a human hand. Rising to a height of over 1,000 feet above the canyon floor, access into and out of upper John's Canyon is limited to one or two tributaries to the north and east. Most are blocked by high, undercut pouroffs or near vertical bare surfaces. At the junction of each side canyon are towering, vertical towers and pinnacles of the Cutler Formation, eroded into myriad shapes and designs. John's Canyon, with side drainages, contains about 19 miles of canyons.

Soils

The majority of the ISA Complex consists of rock outcrop and shallow soils on the rims of canyons, mesas, and structural benches. Soils along canyon floors and broader areas of the benches are moderately deep to very deep loamy and sandy soils. On steep fans along canyon walls are moderately deep to deep stony soils. The soils have generally developed in eolian material and alluvium derived from sandstone. Table 2 gives soil characteristics and land types for the ISA Complex.

Table 3 gives soil erosion conditions for the ISA Complex. Present erosion rates in the ISA Complex average 0.51 cubic yard/acre/year.

Vegetation

The existing vegetation can be categorized into the pinyon-juniper woodland, Great Basin sagebrush, and blackbrush classifications (refer to Table 4). Portions of the ISA Complex are slickrock without substantial vegetation.

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Bare Soil Surface
Rock Outcrop	35	36,932	0	0
Shallow loamy soils on sloping structural benches and ledges	35	36,932	1	5
Deep loamy and sandy soils on gently sloping structural benches and canyon floors	15	15,828	0.1	1
Deep stony soils on steep canyon sides	15	15,828	1	10
Totals	100	105,520		

Source: Hansen, 1985.

TABLE 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/acre/year)	Annual Soil Loss Under Present Conditions: Percent of Area	Acres	Cubic Yards	Annual Soil Loss if Disturbed: Percent of Area	Acres	Cubic Yards
Very High	20	—	—	—	—	—	—
High	10	—	—	—	15	15,828	158,280
Medium	5	—	—	—	35	36,932	184,660
Low	1	50	52,760	52,760	15	15,828	15,828
Very Low	0.1	15	15,828	1,582	—	—	—
None	0	35	36,932	—	35	36,932	—
Totals	—	100	105,520	54,342[1]	100	105,520	358,768[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.51 under present conditions; 3.4 if disturbed.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of ISA Complex
Pinyon-juniper woodland	78,580	74
Great Basin sagebrush	7,840	7
Blackbrush	10,120	10
Barren	8,980	9
Totals	105,520	100

Source: USDI, BLM, 1970.

The pinyon-juniper woodland type consists of mature stands of trees. An understory is present which contains sagebrush, rabbit brush, and annuals.

Within the Great Basin sagebrush type, sagebrush is mostly in mature stands. A limited understory exists of curlygrass, bottlebrush, squirreltail, Indian ricegrass, sand dropseed, and fourwing saltbrush. Within this type 1,900 acres (in three locations) were railed and seeded with crested wheatgrass about 20 to 25 years ago. Sagebrush has reentered the seedings but is not as large or dense as in nonrailed areas.

Blackbrush communities have additional species including fourwing saltbrush and Mormon tea. An understory of curly grass and Indian ricegrass is also present.

The barren areas are primarily steep slopes and drainages with slickrock or soil. Plant density is very low and includes pinyon, juniper, blackbrush, and shadscale.

The major canyons of the ISA Complex contain portions where springs provide year-round water in addition to seasonal flowing water from spring snowmelt and late summer thunderstorms. This water has allowed a riparian habitat (about 5 acres) to form which includes cottonwoods and willows.

There are no known threatened or endangered plant species in the ISA Complex.

Four species (*Astragalus cottamii, Astragalus monumentalis, Erigeron kachinensis*, and *Zigadenus vaginatus*) that may occur within the ISA Complex are sensitive species under review by the Fish and Wildlife Service (FWS) for possible threatened or endangered status.

The Grand Gulch ISA Complex lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) types of the ISA Complex are juniper-pinyon woodland and blackbrush, as listed on Table 5. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 5
Potential Natural Vegetation Types

PNV Type	Acres	Percent of ISA Complex
Juniper-pinyon woodland	74,580	71
Blackbrush	30,940	29
Totals	105,520	100

Source: USDI, Geological Survey, 1978.

Water Resources

Water is a limited resource (but of good quality) within the ISA Complex. There are no perennial streams. There are 23 known springs scattered throughout most of the major canyons; these provide water for recreationists, wildlife, and livestock. Three of these springs have been developed with piping and troughs for livestock use. Also, 12 earthen reservoirs have been constructed on the mesa for livestock use. During the snowmelt or thunderstorm seasons, water is also held in numerous slickrock pools.

Mineral and Energy Resources

The BLM, in consultation with the U.S. Department of Energy, had each WSA and ISA within Utah independently assessed for its energy and mineral resources by Science Applications, Inc. (SAI, 1982). Refer to Appendix 5 for a detailed description of the SAI rating system.

SAI (1982) assigned an overall importance rating (OIR) of 2 to the Grand Gulch ISA and Slickhorn Canyon WSA, an OIR of 1+ to the Pine Canyon and Bullet Canyon WSAs, and an OIR of 1 to the Sheik's Flat WSA. The overall importance rating is given on a scale of 1 to 4, where 4 is equated with high mineral importance. Shades of importance are indicated by + or -. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the ISA Complex. The energy and mineral resource rating summary for the ISA Complex is given in Table 6.

If the ISA Complex is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

TABLE 6
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f2	c2	Less than 10 million barrels of oil; less than 60 billion cubic feet of gas
Uranium/Vanadium	f1	c1	None
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f1	c4	None
Copper	f1	c1	None
Manganese	f1	c1	None
Potash	f1	c3	None

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).

[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. There are no minerals currently listed as strategic and critical found within the ISA Complex (Federal Emergency Management Agency, 1983).

LEASABLE MINERALS

Due to unfavorable geologic conditions, it has been determined that no coal, potash, geothermal, or other leasable resources, with the exception of oil or gas, are present in this ISA Complex. There are no leases for these resources in the ISA Complex.

Oil and Gas

The oil and gas potential in the ISA Complex is low. Although the ISA Complex has no record of production, shows of oil and gas in some wells suggest the possibility that oil and gas may be present in Permian, Pennsylvanian, Mississippian, and Devonian rocks. The area may be outside the saline facies of the Hermosa Formation

(Pennsylvanian) that contains the major oil fields in the Four Corners region. Moreover, much of the Hermosa correlating with productive zones is breached by the San Juan River near the ISA Complex so that oil formerly present may have drained away. Nevertheless, structural and stratigraphic traps in the Pennsylvanian rocks may be sealed by impermeable facies from reservoir drainage into the canyon of the San Juan River. The rating for oil and gas indicates an in-place potential of less than 10 million barrels of oil or less than 60 billion cubic feet of gas. Of this, 3 million barrels of oil and 18 billion cubic feet of gas would be considered recoverable.

Approximately 57 oil and gas wells have been drilled near the ISA and five inside the ISA. Shows of oil and gas were encountered in Permian, Pennsylvanian, Mississippian, and Devonian strata. None of these wells were productive, and all of the wells were plugged and abandoned. Two wells were drilled into the Paradox Formation in 1982. Both of these recent wells were dry holes and have been plugged and abandoned due to lack of production.

Approximately 60,260 acres of the ISA Complex have been leased. Forty (53,040 acres) of the leases are pre-FLPMA and nine leases (7,220 acres) are post-FLPMA (refer to Table 7).

TABLE 7
Existing Oil and Gas Leases

Unit	Pre-FLPMA	Post-FLPMA
Grand Gulch	0	0
Pine Canyon	4 (6,640 acres)	5 (1,250 acres)
Bullet Canyon	5 (5,450 acres)	1 (3,070 acres)
Sheiks Flat	5 (2,350 acres)	0
Slickhorn Canyon	26 (38,600 acres)	3 (2,900 acres)
Totals	40 (53,040 acres)	9 (7,220 acres)

Source: USDI, BLM, 1975.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs and ISAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

Oil and gas leasing categories were established for the ISA Complex as follows: Category 2 (standard and special stipulations), 41,172 acres; Category 3 (no surface occupancy), 15,165 acres; and Category 4 (closed to leasing), 49,183 acres (refer to Table 8). Approximately 3,923 acres of the existing 60,260 acres of oil and gas leases are within the Category 4 area.

TABLE 8
Existing Leasing Categories

Unit	Acres	Category 4 Closed to Leasing	Category 3 No Surface Occupancy	Category 2 Special Stipulations	Category 1 Standard Stipulations
Grand Gulch	37,580	37,580 (100%)	0	0	0
Pine Canyon	10,890	2,400 (22%)	2,760 (25%)	5,730 (53%)	0
Bullet Canyon	8,520	960 (11%)	3,320 (40%)	4,240 (49%)	0
Sheiks Flat	3,140	0	522 (17%)	2,618 (83%)	0
Slickhorn Canyon	45,390	8,243 (18%)	8,563 (19%)	28,584 (63%)	0
Totals	105,520	49,183 (47%)	15,165 (14%)	41,172 (39%)	0

Source: USDI, BLM, 1975.

LOCATABLE MINERALS

No mining claims are known to have been located within the ISA Complex. Due to geologic unfavorability, there are no known locatable minerals in the ISA Complex.

Wildlife

Animals common in pinyon-juniper woodlands are found throughout the ISA Complex. The

canyons provide intermittent riparian habitat for a diversity of wildlife species.

Mule deer inhabit some of the canyons yearlong. Most deer utilize the area as winter range from October through April. The ISA Complex is within the Utah Division of Wildlife Resources' (UDWR) Deer Herd Unit 31B. Due to extremely low populations and productivity, this herd unit has been closed to hunting since 1980. In previous years there were very few deer hunters in the area. About 2,900 acres are classified as crucial deer winter range.

Portions of the ISA Complex (mainly Grand Gulch, Bullet, Slickhorn, and John's Canyons) are within the White Canyon-Red Canyon Desert Bighorn Habitat Management Area. There have been no documented sightings of desert bighorn sheep in this area since 1975. Past evidence of bighorn sheep (i.e., weathered skulls, piles of pellets under rims, and petroglyphs) can still be found in some canyons. The closest known remnant population of desert bighorn sheep is found along the San Juan River from the Goosenecks to Grand Gulch. Bighorn sheep may still occasionally utilize the ISA Complex, but populations are not expected to reestablish in the ISA Complex at this time. About 3,900 acres are classified as crucial yearlong bighorn sheep habitat.

Spotted skunk and ringtail cat are found in the wetter canyons, but are rarely observed due to their nocturnal habits and sparse densities. Bobcat and mountain lion inhabit remote canyons where they are seldom seen. Coyote, cottontail rabbit, white-tail antelope squirrel, Ord kangaroo rat, pinyon mice, white throat woodrat, and assorted bats are found unit wide.

There is very little waterfowl habitat within the ISA Complex. Mourning dove is the only gamebird that nests in the area. Hairy woodpecker, violet green swallow, titmouse, pinyon jay, and rock wren are also common. The greatest diversity of nongame birds is found in the canyons during the spring migration. Red-tailed hawk, American kestrel, Cooper's hawk, and great horned owl are found throughout the area.

The most common reptiles and amphibians found within the ISA Complex are the Great Basin spadefoot toad, red-spotted toad, side-blotched lizard, Great Basin gopher snake, and Hopi rattlesnake. There are no fish species present.

The FWS has identified this area as having potential for blackfooted ferret. The bald eagle is a winter transient in the vicinity of the ISA Complex; however, no roosting sites have been located. Both of these species are endangered.

There are no acres classified as Federally designated critical wildlife habitat in the ISA Complex, nor are there existing or planned wildlife management treatments or facilities.

Forest Resources

There are 78,580 acres of pinyon-juniper woodland within the Grand Gulch ISA Complex. These are low quality sites (less than 20 cubic feet usable wood per acre) and are considered nonproductive forest land. At the present time, pulp and papermaking opportunities are low. No areas within the ISA Complex have been designated or have potential as Christmas tree cutting areas. Less than an estimated 12,280 cords of firewood would be within the ISA Complex.

During 1981, 26 permits were sold to cut 1,700 juniper posts in the Cedar Mesa area. Due to the lack of roads within the ISA Complex, it is unlikely that any posts were cut there. In 1981, there were 323 free-use firewood permits issued in the San Juan Resource Area. Some of these permits were utilized in the Cedar Mesa area, but it is unlikely that many individuals gathered firewood from within the ISA Complex. Most firewood cutting now taking place on Cedar Mesa occurs adjacent to access routes that are outside the ISA Complex.

Pinyon nuts are gathered by a few individuals, but there have been no commercial gathering permits issued for areas in or near this ISA Complex.

Livestock and Wild Horses/Burros

The Grand Gulch ISA Complex contains portions of four grazing allotments, involving seven operators. Table 9 summarizes allotment use data.

Current use of the ISA Complex is estimated to total 1,930 AUMs and includes 1,299 AUMs in the Slickhorn Allotment, 479 AUMs in the Lake Canyon Allotment, 90 AUMs in the Texas Muley Allotment, and 62 AUMs in the Perkins Brothers Allotment.

The ISA Complex contains several range improvements including three developed springs, 12 earthen reservoirs, three seedings (1,900 acres), and several miles of fence. Currently planned projects include three land treatments on 4,680 acres as well as one spring development, seven reservoir developments on the mesas, and 2.5 miles of water pipeline. Proposed land treatments would result in 1,118 additional AUMs.

Areas of the ISA Complex with deeper soils may have potential for dry farming. No plans have ever

TABLE 9
Livestock Grazing Use Data

	Allotments				
	Slickhorn	Lake Canyon	Perkins Brothers	Texas Muley	Unallotted Acreage Within Grand Gulch ISA Complex
Number and Class of Livestock in Allotments	219 C[1] 5 H	600 C 12 H	1,082 C	274 C	
Number of Operators	1	1	4	1	
Season of Use	10/16 to 6/15	10/16 to 6/5	11/1 to 5/31	11/15 to 5/31	
Total AUMs in Allotments	1,795	4,895	7,579	2,712	
AUMs in ISA Complex	1,299	479	62	90	
Total Acres in Allotments	143,624	609,930	106,103	75,617	
Acres in ISA Complex	63,770	22,230	5,570	4,790	9,160
Percent of Allotment Acres in ISA Complex	44	3.6	5.2	6.3	

Source: USDI, BLM, 1971.

[1]C = Cattle; H = Horses

been proposed nor has interest been shown for this type of use.

Vehicular use for livestock management occurs on the boundary roads and on existing ways. The degree to which existing ways are used is unknown.

There are no wild horses or burros in the ISA Complex.

Visual Resources

The ISA Complex presents a landscape with a diversity of colors and shapes within the landform and vegetation.

The ISA Complex consists of two major landform types: canyons and mesas. The canyons have been cut through Cedar Mesa Sandstone, forming a meandering pattern of steep-walled sides up to 800 feet deep. The major texture is the smooth slickrock while rough talus slopes of jumbled rock occur at various locations. Arches, pinnacles, and rincons provide additional visual variety to this landform. Colors vary in intensity with the location of the sun, but are generally shades of reds, browns, and grays. The mesa type consists of flat to rolling sandstone outcrops and soil areas. Texture is generally smooth with colors ranging from dark browns and reds to light tans.

The vegetation varies with the landform. The canyons contain a desert type with sage, cactus, and annuals present which provide contrasting bright colors as they flower. Adjacent to the drainage bottom, a riparian habitat exists containing cottonwoods and willows. The dominant vegetation type of the mesa is pinyon-juniper woodland. The color of larger vegetation varies from light gray-green to dark or bright greens. These colors create a contrast with earth tones of the landform.

The ISA Complex contains VRM Classes I, II, III, and IV (with Class I being most restrictive) and Class A, B, and C scenery (with A being highest quality) (refer to Table 10). The BLM Visual Resource Evaluation System was used to rate the visual resource values of the area. The BLM's VRM rating system is explained in Appendix 7. The Grand Gulch ISA is rated Class I due to its status as a Primitive Area. Generally, the canyons are rated VRM Class II with Class A scenic quality. The forested mesas generally are VRM Class III with Class B scenic quality, and the blackbrush mesa west of Grand Gulch is rated as VRM Class III, with Class C scenic quality.

TABLE 10
Visual Resource Quality and Management Class

Element	Acres	Percent of ISA Complex
Scenic Quality		
Class A	56,520	54
Class B	47,860	45
Class C	1,140	1
Management Class		
Class I	37,580	36
Class II	20,140	19
Class III	32,400	31
Class IV	15,400	14

Source: USDI, BLM, 1970.

Cultural Resources

Archaeological excavation work occurred in the ISA Complex (mostly Grand Gulch) as early as the 1890s and, by 1920, about 100 sites had been noted. This work was for the primary purpose of obtaining artifact collections for museums in the eastern United States. In the 1950s and 1960s archaeological work began to be more systematic and research oriented.

The ISA Complex contains a wealth of pristine Anasazi cultural resources. A literature search revealed 580 recorded sites (Grand Gulch ISA, 165; Pine Canyon WSA, 55; Bullet Canyon WSA,

109; Slickhorn Canyon WSA, 191; and Sheiks Flat WSA, 60) representing a fairly even distribution between Basketmaker and Pueblo cultural manifestations. Most of the Basketmaker sites consist of camps, lithic scatters, and storage cists, while the majority of Pueblo sites are either open habitation camps or cliff dwellings which include habitation and/or storage structures (granaries). It is also probable that the area was used by the Archaic and Ute/Navajo peoples. Many sites have been stabilized.

There are also features of historic value in the ISA Complex. A portion of the northern boundary follows the historic "Hole-in-the-Rock Trail." This is the route the early Mormon settlers followed in 1879 to settle the Town of Bluff, Utah.

Another special feature of this unit is the historical value of the past use of the land. In the early 1900s lower John's Canyon was explored for oil. A man named Galloway drilled a well 1,900 feet deep and found enough oil to run the pumps but not enough for commercial production. Two capped drill holes are in John's Canyon and the other at the end of the "cherry-stemmed" road in the lower main John's Canyon. These were drilled with a steam-powered engine. Near the drill hole in the fork of John's Canyon, there are numerous old tree stumps. The trees were probably cut to power the steam engine.

In the 1920s John Oliver and his brother Bill built a ranch and ran cattle in the canyon. The only remnant of the Oliver ranch is a collapsed cabin, tack shed, corral, and dugout.

Noticeable evidence is scarce, but early 20th century cowboys undoubtedly used the land within this area for their range cattle. Items which are left include piled juniper log drift fences and old rusted cans.

The Grand Gulch Archaeological District (4,240 acres), which occupies the central portion of the ISA Complex, was placed on the National Register of Historic Places in 1982.

Additionally, based on estimates from similar settings in the area, it could be expected that 12,360 sites would be located in the ISA Complex of which 8,240 could be National Register eligible.

Vandalism of cultural artifact sites is currently a significant problem which ranger patrols, including patrols by helicopter, have been initiated to alleviate.

Recreation

The ISA Complex provides opportunities for various and unique recreation experiences. Hiking, backpacking, camping, and horseback riding are the most common and are often combined with the study of archaeological and natural resources. Grand Gulch ISA is the heart of this ISA Complex with use increasing steadily (2,081 visitor days in 1974 compared to 17,521 visitor days in 1984). As this visitation has increased, use has spread out to other adjacent areas such as Slickhorn and John's Canyons. Visitation is compiled from trail registers or permits which visitors are requested to obtain. Actual visitation is probably substantially higher than that recorded and is estimated to average about 20,000 visitor days per year. Recorded visitation for 1980 through 1984 is as follows: 1980, 15,488; 1981, 13,431; 1982, 13,242; 1983, 16,727; and 1984, 17,521. About 25 percent of the recorded annual visitation is comprised of educational and commercial group use.

Access into Grand Gulch varies from trails negotiable by horseback to talus slopes and ledges that are difficult to negotiate on foot. The time spent in the canyon varies from dayhikes to up to 2 weeks. The most popular routes are from Kane Gulch and back out Kane, from Kane Gulch to Bullet, or Kane Gulch to Collins Spring.

Spring is the most popular time for visitation into Grand Gulch with March, April, and May accounting for 61 percent of the use and September, October, and November receiving another 19 percent. The remaining use (20 percent) occurs during the summer and milder portion of the winter season.

Grand Gulch attracts visitors from a multi-state and national base. An analysis of visitation shows that about 29 percent of the visitors are from Colorado, 24 percent from Utah, 6 percent from New Mexico, and 4 percent from Arizona. This totals 63 percent visitation for the Four Corners states. Additionally, 26 percent of the visitation is from states beyond the Four Corners area. For the remaining 11 percent, visitor origin is unknown.

Use in Slickhorn and John's Canyons is probably by the same visitors as in Grand Gulch. Inquiries on these areas often indicate that visitors have already hiked Grand Gulch and are looking for new locations.

The four forks of Slickhorn provide hiking access into the canyon and tend to distribute the hikers

along the length of the canyon. An increasing amount of use is occurring in conjunction with the San Juan River. A loop trip up Slickhorn across the mesa and into Grand Gulch then down to the river and back to Slickhorn is becoming more popular. Access on this hike can be from the river (float trips) or land-based.

John's Canyon is the least used of the major canyons in the ISA Complex. The upper reaches are seldom used but provide an excellent location for solitude, with only a short hike. The lower canyon is accessible from a county road, and the open nature of this portion allows motorized recreation to occur for about 1 mile upcanyon within the ISA Complex. The motorized use of this portion is very limited at present.

The pinyon-juniper-covered mesa tops surrounding the canyons are utilized by recreationists primarily as access routes into the adjacent canyons. Limited camping does take place in the vicinity of the canyon rims; hiking and backpacking between vehicle and canyon destinations are only short-lived due to other more spectacular attractions of the canyons.

ORV use in the ISA Complex is currently minimal (less than 100 visitor days per year). Grand Gulch Primitive Area (there are approximately 15 miles of ways in this area) has been closed to motorized use since 1970, and the topography greatly restricts motorized use in other portions of the ISA Complex to the existing 15 miles of ways outside the Primitive Area. The Hole-in-the-Rock Trail, which forms a portion of the unit's northern boundary, is the most often used ORV area within or adjacent to the ISA Complex.

Hunting is a limited activity in the ISA Complex and occurs mainly adjacent to the boundary roads. The hunting that does occur is for small game (mostly cottontail rabbits) and mule deer. However, Deer Herd Unit 31B, in which this ISA Complex is located, has been closed to deer hunting since 1980.

During the fall and winter months there is some trapping for fur-bearing animals (coyote, bobcat, and fox) adjacent to roads.

Wilderness Values

SIZE

The ISA Complex, at 105,520 acres (Grand Gulch, 37,580 acres; Pine Canyon, 10,890 acres; Bullet Canyon, 8,520 acres; Sheiks Flat, 3,140 acres; and Slickhorn Canyon, 45,390 acres), is of such size as to greatly enhance the wilderness values present. The ISA Complex is approximately 19 miles north to south and approximately 16 miles east to west.

NATURALNESS

Imprints of man within the ISA Complex are mostly limited to rangeland developments (such as fences, reservoirs, and developed springs) and vehicle ways. Major imprints were excluded by boundary adjustments during the *BLM Intensive Wilderness Inventory*. Those remaining imprints, including five reclaimed oil and gas test well sites, are not substantially noticeable within the ISA as a whole or would be capable of being reclaimed naturally or with hand labor.

Very few imprints of human activities are present in the Grand Gulch ISA. These are limited to some trail improvements in the side canyons, a number of closed ways on the plateaus, a few trail signs, and two portable radio repeater installations. There has also been stabilization of ruins at some cultural sites. These imprints are discussed below.

1. A way beyond Collins Spring trailhead parking area, 5.5 miles in length, travels along the southwest rim of Grand Gulch. This way goes over slickrock and cuts through blackbrush. The way is visible from high points near it.

2. A way leading to an old seismic line is 1.75 miles long. This way is cut through desert shrub vegetation and so is noticeable only from an airplane or when traveling upon the way. The shrubs effectively screen the way from being noticed from the ground at a distance of 25 feet or more.

3. A way just north of way No. 2, extending 1.5 miles into the unit, is probably associated with past seismic work. Portions of the way may actually be the seismic line. The first part of this way, as it passes through rolling grassland, is noticeable in the area. Toward the end of the way, it becomes less used and less noticeable.

4. From a reservoir, a way extends 2 miles into the unit, ending at Grand Gulch rim. The way winds among pinyon-juniper along the rim of Coyote Canyon. Cryptogamic soil has started to return to sections of the tracks, and in places the way is hard to find.

5. From Sheiks Flat, a way extends 2 miles into the unit, ending on Bullet Canyon rim. This was once a constructed way, but now is

deteriorated to two-wheel tracks through the sage and pinyon-juniper. It is especially unnoticeable where it leaves the Sheiks Flat road.

6. Hardscrabble Way travels across northern Polly's Pasture for 2 miles to a small side canyon of Grand Gulch. Past the reservoir, this way is very seldom used; in places only one-wheel track is maintained by the passage of livestock.

7. On southern Polly's Mesa is a way leading to Government Trail which passes 0.75 mile through the unit. This way is similarly maintained by the passage of livestock and hikers.

Trail improvements in three locations were completed in the ISA Complex during the 1950s and 1960 by blasting of short sections of slickrock. Collins Spring Canyon blasting is the most substantial, involving 75 feet of trail across slickrock around a pour-over. The blasting at Kane Gulch and Government Trail is not evident to most hikers.

Other imprints are one reservoir in Section 32, just off Hardscrabble Way, and old seismic lines and spots near the ways in the western part of the unit.

The most substantial human imprint within the Pine Canyon WSA is a way in the east portion that extends 2.5 miles into an old drill site. The way has been cut and bladed through dense pinyon-juniper, but does not now appear maintained by other than vehicle passage. Here and there vehicles have pulled off the way, probably for woodcutting. Minimal impact is created due to the screening provided by the dense pinyon-juniper in this area.

The Hole-in-the-Rock Trail, a rough jeep trail, forms the unit's northern boundary. Vehicle tracks extend from this trail in only a few places. A very little used way extends into the unit on Dripping Point. This way is difficult to follow. There are signs of seismic activity along this trail that are becoming hard to find.

In the western end of the Hole-in-the-Rock Trail there is a steel post-barbed wire fence with a gate. A historic drift fence lies within the unit in Dripping Canyon. This fence was made of piled juniper logs probably in the 1920s.

In the Bullet Canyon WSA imprints associated with grazing activities include four reservoirs, three feed troughs, three developed springs, two drift fences, and two railed areas. The sagebrush railings, completed about 1956, have regrown and are no longer noticeable. The four earthen dam stock reservoirs are all served by the boundary roads. Also along the boundary within the unit are three metal feed troughs. The most developed spring is in the unit's extreme southeast in a shallow but steep-walled canyon. This improvement consists of a metal pipe, cement box, and wood/metal trough constructed in 1944. The drift fences may be historic and consist of piled juniper log fences; the one in the north has deteriorated to a no longer useful condition.

Along the unit's southern boundary road six short seismic lines exist. The only one that is easily noticeable is the one across Bullet Canyon from the trailhead parking. This one is aligned up with the road on the north side of the canyon and cuts through dense pinyon-juniper woodland. The rest are substantially unnoticeable, having been cut through sage and sparse pinyon-juniper and revegetated over the years.

Across the west central part of the Bullet Canyon area, Hardscrabble Way travels across several washes to a reservoir just inside the Grand Gulch Primitive Area. A portion of this way is now signed "Closed to Motorized Vehicle Travel."

There are two places where vehicle travel has created ways into the unit. They are in the eastern portion of the unit along the edge of Bullet Canyon. They both wind among the pinyon and juniper trees; the north side way is now used solely by hikers. The one on the south appears to be the result of firewood cutting.

Imprints in the Sheiks Flat WSA include a 26-year-old railing. The sagebrush has returned, obscuring most evidence of the railing. Two old seismic lines extend into the unit from the southern boundary road. These lines are well screened by pinyon-juniper forest and, hence, have little effect on overall naturalness. The four stock reservoirs are also substantially unnoticeable. A way leaves the unit from the reservoir at the extreme southwest corner. The only other imprint found was an old sheepherder's structure north of the Coyote Flat road.

Imprints along the roads in northwest Slickhorn WSA are minimal within the unit and substantially unnoticeable. Near Government Trailhead an old seismic line and old way are in the unit just north of the boundary road. This seismic line and way are well revegetated to the point of being hard to find. Further west, a juniper pole-barbed wire fence extends perhaps 30 yards into the unit (north of the road). Near the end of the fence, a short (40-foot) livestock access has been bulldozed down to a spring.

In Section 14 of the northwest part of the Slickhorn Canyon WSA, just north of the Polly's Mesa loop road, there is an earthen dam stock reservoir with cattails growing in it. Nearby there are numerous cattle paths and a metal water trough. The reservoirs are all roughly 4 feet tall by 30 feet wide with a 30-foot by 50-foot reservoir area.

From the "cherry-stemmed" drill hole in Section 15, vehicle tracks extend .25 mile south into the unit. These tracks are substantially revegetated with grasses and small shrubs.

Another juniper pole-barbed wire fence is in Section 19. This fence extends across a narrow mesa top about .25 mile.

Finally, along the Polly's Mesa loop road, near its junction, a way leads .50 mile to an old corral. Here a deteriorating wood fence encloses a small alcove, and below it is one of the previously mentioned reservoirs.

In the north-central part of this ISA Complex there are two "cherry-stemmed" drill pads. In the creekbed just east of the most northern drill pad, a 10-foot stretch has been bulldozed to allow cattle access to a spring. This imprint is not very noticeable, being directly in the wash bottom.

In the south-central part of this unit, the Point Lookout Fence angles between the third fork of Slickhorn Canyon and a westerly fork of John's Canyon. This fence was built in 1980 with steel posts and four strands of barbed wire. It extends through moderately dense pinyon-juniper for about 2 miles. Tree cuts are minimal but there are vehicle tracks associated with its construction. The pinyon and juniper trees effectively screen views of the fence from any distance other than on the fence line.

Also in the Point Lookout area, at the south end of the "cherry-stemmed" county road, are three reservoirs located in Sections 10, 11, and 14. The one in Section 10 has a 3-foot-tall 15-foot-long berm to hold water in a slickrock depression. The dam in Section 11 is relatively large, being about 12 feet high by about 30 feet long, its pool area is also on slickrock. The reservoir in Section 14 is of approximately 40-foot diameter. In Section 11, a spring was at one time improved in the bottom of a shallow canyon. Now the improvements (two troughs and some pipeline) are largely dilapidated. A way connects the reservoir in Section 11 with the one in Section 14. This way is maintained solely by the passage of vehicles, mostly over slickrock. The Point Lookout reseeding of 640 acres was completed in 1963. Regrowth of sage has occurred obscuring the plant deadfall and the flat, open area still has much grass growth. The average visitor would probably not recognize this as a range plant manipulation project.

In the John's Canyon area, imprints are confined mainly to the mesa tops. However, in lower John's Canyon there is the old homestead site, a way, and an old steam drill hole. The homestead from the 1930s consists of a corral made of juniper poles with cables from the old drilling operation strung between them, the frame of a small tack shed, and two collapsed dugout structures. A juniper pole fenceline in disrepair, probably associated with this homestead, extends across the valley in this area. A large stand of cottonwood trees provides shade and aids in screening these impacts.

Up the valley of John's Canyon the passage of vehicles has created a way for 2.3 miles beyond the "cherry-stemmed" road and drill pad in Section 25. The way crosses washes at three points, but for the most part consists of two-wheel ruts over grass and sage, with greasewood nearby. The way ends at an old cowboy camp with a fire pit and old rusted cans. Since this way crosses the wide-bottomed, open valley it is visible from most any vantage point within 1 mile, especially the canyon rims.

In the west fork of John's Canyon, Section 18, there is a capped drill hole, pipes, and a few other steel pieces of equipment laying around. These are remnants of a steam-powered drilling operation in the early 1900s and have historic value. There have been several pinyon trees cut down in the area, probably for powering the steam drill. The access road was probably in the wash since there is no longer any sign of it.

The upper forks of John's Canyon are rugged and impassable to vehicles, although there are many access points for vehicles to the canyon rims from roads nearby and Highway 261. Off-road woodcutting seems to be responsible for most of the vehicle tracks along the rims. Along the rim of the western-most fork of John's Canyon, the passage of vehicles has created 6 ways totalling about 4.7 miles into the unit. The ways wind among the pinyon and juniper trees and show up on the cryptogamic soil.

The eastern boundary way serves nine reservoirs, only two of which are on the west side of the way and within the unit. One reservoir is U-shaped and the dam is about 8 feet tall. The other has a 3-foot-tall dam and 25-foot-diameter reservoir.

Three short seismic reflection lines are on the mesa above John's Canyon. All three are less than 0.75 mile long. These lines have been cut through moderately dense pinyon-juniper forest; hence, they are seen easily from the air but screened well on the ground.

The seeding in the unit's extreme southeast, the Muley Point reseeding, was done at the same time as the Point Lookout reseeding and has similarly undergone revegetation with sage although many grasses still thrive. As with the Point Lookout reseeding, this plant manipulation would not be obvious to the average visitor.

Two steel-pole/barbed-wire fences extend for very short distances into the unit on the rim of John's Canyon.

Finally, a spring in Section 34 has had a cattle access bulldozed to it for about 20 yards down from an overhanging ledge.

These imprints cover less than 1 percent of the ISA Complex, and meet the naturalness standard for areas under wilderness review. The 105,520 acres are natural in character.

SOLITUDE

The ISA Complex provides outstanding opportunities for solitude. The desert canyon system, including four major canyons and numerous tributaries, offers over 190 miles of canyons for users to experience seclusion. The meanders, high cliffs, and vegetation screening effectively block lines of sight and muffle sounds for any substantial distance. Outside intrusions and influences are essentially nonexistent within the canyons. The majority of the mesa tops have pinyon-juniper vegetation which, when combined with the limited topographic relief, effectively screens visitors and allows for solitude. A major commercial flight path connecting Los Angeles, California; Chicago, Illinois; and New York, New York crosses over the Grand Gulch Plateau. The occasional high altitude overflights only reminds a person of the outside world and do not detract from the opportunities for solitude within the ISA Complex.

There are several small areas of the ISA Complex where opportunities for solitude are not outstanding.

One such area is in the western portion of the Pine Canyon WSA. About 800 acres have little topographic relief and contain mostly low-lying desert shrub with scattered pinyon-juniper trees. This area is adjacent to Highway U-263, and motorized travel on this route limits the opportunities for solitude.

Another is in the Sheiks Flat WSA and is comprised of about 600 acres of sagebrush flat adjacent to the southern boundary road. The lack of screening allows travel on this road to restrict outstanding opportunities for solitude.

Another area is located in the southeastern corner of the Slickhorn Canyon WSA. About 200 acres of sage flat and seedings occur within 1 mile of the Muley Point road. Travel on this road also limits outstanding opportunities for solitude.

The other areas adjacent to the boundary roads have a pinyon-juniper woodland that would screen users from the road after about 100 yards or are adjacent to boundary roads so infrequently traveled as to not impose a significant restriction to the opportunities for solitude. The Loop Road into Polly's Pasture is a case in point. In summary, over 98 percent (103,920 acres) of the ISA Complex meets the outstanding opportunities for solitude criterion for areas under wilderness review; 1,600 acres do not meet the solitude criterion.

PRIMITIVE AND UNCONFINED RECREATION

Grand Gulch and its side canyons are well known for their primitive recreation opportunities. Slickhorn and John's Canyons are also receiving increasing amounts of use for camping and hiking. The more than 190 plus miles of canyons have access points that are scattered enough to disperse hiking users throughout their lengths. Horseback travel also occurs in the ISA Complex; however, topography limits their access to the Collins and Kane Gulch trailheads in Grand Gulch and lower John's Canyon. Horseback travel is also possible over most of the mesa tops, as is hiking and camping. Grand Gulch and Slickhorn Canyons also provide side canyon hiking opportunities from float boating trips on the San Juan River.

Sheer sandstone cliffs, pinnacles, knobs, arches, and an abundance of cliff dwellings all contribute to a high quality recreational experience as well as educational and scientific studies.

In addition to the outstanding hiking and camping opportunities, the striking scenery provides opportunity for high quality sightseeing and photography. Although not outstanding because of low population concentrations, birdwatching and wildlife observation supplement a user's outdoor experience.

The outstanding opportunities for backpacking, archaeological study, and associated activities allow the entire ISA Complex (105,520 acres) to meet outstanding recreation criterion for areas under wilderness review.

SPECIAL FEATURES

The ISA Complex offers supplemental features of scenic, geological, archaeological, and historical value. These features enhance the other opportunities available in the Complex.

The canyons of the ISA Complex offer a myriad of sandstone shapes and colors twisted and carved in eroded white, reds, browns, and yellows. In the sheer sandstone canyons, pinnacles, pedestals, knobs, arches, and alcoves offer unique and dramatic views around every meander.

On the mesa tops long distance views are possible and include such scenic focal points as Monument Valley, Navajo Mountain, Red House Cliffs, and the Henry Mountains.

The major supplemental value in the ISA Complex is the remains of extensive Anasazi Indian occupation from about 200 A.D. to 1300 A.D. The Complex contains 580 recorded sites and an estimated 12,360 sites which consist of lithic scatters, walled fireplaces, pictographs, petroglyphs, pithouses, pottery shards, towers, cliff dwellings, and kivas. Not only are these of scientific interest, but they are scenic and make interesting discoveries for the recreationist.

There are also features of historic value in the ISA Complex. A portion of the northern boundary follows the historic "Hole-in-the-Rock Trail." This is the route the early Mormon settlers followed in 1879 to settle the town of Bluff, Utah.

There is also evidence of use by cattlemen in the early 1900s, including the Oliver Ranch in lower John's Canyon.

Land Use Plans and Controls

There are four sections (2,400 acres) of land owned by the State of Utah within the ISA Complex. Three of these are within the Slickhorn WSA and one is between the Pine Canyon WSA and the Grand Gulch ISA. All other lands within the ISA Complex are Federally owned. There are no private or split-estate lands.

There are 13 sections of land owned by the State of Utah adjacent to the ISA Complex. All of these can be accessed by roads outside the ISA Complex except for Township 40 South, Range 16 East, Section 2 which is isolated by the Glen Canyon NRA on the south.

Other lands adjacent to the ISA Complex are Federally owned. Glen Canyon NRA adjoins the ISA Complex on the south. Lands immediately adjacent to the south end of the ISA Complex are included in Glen Canyon NRA and are recommended by the National Park Service (NPS) for designation as the San Juan Wilderness Area (13,070 acres).

By authority of Multiple Use Classification No. U-8131, on September 24, 1970, BLM withdrew the Federal lands within the Grand Gulch ISA (37,580 acres) from disposal, mining claim location, and surface use and occupancy. The withdrawal was made to establish the Grand Gulch Primitive Area. The State-owned lands within and adjacent to the Primitive Area were not included in this withdrawal since the exchange with the State of Utah had not been completed, and these sections were not yet Federally owned. The exchange was completed in 1977, and these sections are now Federally owned and withdrawn. Also, the lands 50 feet on either side of the Hole-in-the-Rock Trail were segregated from disposal, mining claim location, and surface use and occupancy. The Hole-in-the-Rock Trail forms the north boundary of the Complex.

BLM has a public water reserve withdrawal on 160 acres in one location within the ISA Complex. The withdrawal is intended to protect and preserve bodies of water, springs, and water sources for public use. Valid and legitimate purposes for which water are reserved include stockwatering, human consumption, agriculture, and use by fish, wildlife, and their habitat.

Rights-of-way for communication sites exist in two locations, Township 38 South, Range 16 East, Section 27: Northwest¼ Southwest¼ Southeast¼; Township 38 South, Range 17 East, Section 34: Southeast¼ Northwest¼ Northwest¼. These rights-of-way presently are not being used. BLM has two small portable radio communication facilities within the ISA Complex.

Access to the ISA Complex is possible from State Highways U-261 and U-263. Additionally county and BLM roads provide access in numerous locations along the ISA Complex boundary.

The lands in the ISA Complex, except the Grand Gulch ISA, were classified for multiple-use management by BLM's Multiple Use Classification No. U-8131 of September 24, 1970. The ISA Complex was set aside as a primitive area by the same number.

A small corner of the Federal land in Township 39 South, Range 18 East, Section 4, along with other land contiguous to the eastern boundary of the ISA Complex, were identified by BLM land use plans for disposal by sale. This land was classified for sale by Multiple Use Classification No. U-8131

of September 24, 1970. The law under which the lands were to be sold was repealed by FLPMA, so the classification for sale is presently being reviewed for the purpose of rescinding the classification.

The ISA Complex is located in the BLM San Juan Resource Area. Land use planning is governed by the South San Juan Planning Unit MFP (USDI, BLM, 1971) which is scheduled for replacement by the San Juan Resource Area RMP in 1986. Important features of the MFP include management of the Grand Gulch ISA as a Primitive Area with use restrictions as described in the No Action Alternative.

The *San Juan County Master Plan* (Planning and Research Associates, 1967) emphasizes multiple use of public lands and zones the majority of the ISA Complex as open range/forest lands. An area along the eastern boundary of the Shieks Flat, Bullet Canyon, and Slickhorn Canyon WSAs is listed as potential future agriculture land. This Plan predates wilderness considerations; however, the San Juan County Commission (1980) opposes any legislative or administrative designation of wilderness in the county.

Socioeconomics

DEMOGRAPHICS

The Grand Gulch ISA Complex lies in southwestern San Juan County. The nearest communities are Bluff, approximately 25 road miles to the east and Blanding, about 45 miles to the northeast. The socioeconomic effects of designation would be confined mostly to San Juan County. The county can be summarized as rural and sparsely populated.

San Juan County had a 1982 population of 12,700, not quite 1 percent of the state population (University of Utah, Bureau of Economic and Business Research, 1983). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers. Monticello, about 60 road miles northeast of the ISA Complex, had a 1980 population of 1,930, and Blanding, about 45 road miles northeast of the ISA Complex, had a 1980 population of 3,120 (U.S. Department of Commerce [USDC], Bureau of the Census, 1981).

San Juan County is one of the largest counties in Utah, comprising 7,885 square miles (about the size of New Jersey). About 86 percent of the county is owned by the Federal Government, 6 percent by the State of Utah, and 8 percent by private landowners (University of Utah, Bureau of Economic and Business Research, 1979). The southern 20 miles of the county are included in the Navajo Indian Reservation.

EMPLOYMENT

Even though local employment in the mining industry decreased by 20 percent between 1980 and 1982 due to a downturn in local uranium mining and milling, it still remains the largest local private employer (Utah Department of Employment, 1983).

Recent statistics indicate that mining directly accounts for half of the income and about 32 percent of the employment in the county (refer to Table 11). Because the mines and mine employees both purchase products locally, mining's total local importance is even greater. Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of

TABLE 11

1982 Employment and Income
San Juan County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance, and Real Estate	1	1
Services	8	11
Other	—	—
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	96
Unemployment (1st Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

NOTE: Because of rounding, numbers are not additive. Employment percentage figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other.

county residents are on welfare and are, therefore, not included in unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

INCOME AND REVENUES

Past activities in the ISA Complex that could be of some local economic consequence include mineral exploration, livestock production, and dispersed nonmotorized recreation. Table 12 summarizes local sales and Federal revenues derived from the ISA Complex. Appendix 9 identifies the multipliers used to estimate income and revenues.

TABLE 12
Local Sales and Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases and Production	None	$180,780
Livestock Grazing	$40,000	$2,702
Recreational Use	Less than $82,000	$1,500
Total	Less than $122,000	Up to $184,982

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total local income that would be generated by these expenditures.

Previous exploration of the ISA Complex for oil and gas has brought some income and temporary employment to residents of the area. Approximately 61 oil and gas wells have been drilled in or near the ISA Complex over the past 30 years. This drilling has generated an estimated 92 man years of employment, some of which probably represents local employment.

Some woodland products are harvested from the ISA Complex; however, the harvests have been small and are insignificant to the local economy and only of minor significance to those involved in the harvest.

Seven livestock operators have grazing activities in the ISA Complex. Based on the consumption of 1,930 AUMs of forage by cattle, it is estimated that the ISA Complex accounts for $38,600 of livestock sales, and $9,650 of ranchers' returns to labor and investment.

Historical hunting pressure in the Complex has been low, and its local economic importance is insignificant. The ISA's motorized recreational use is low (less than 100 visitor days annually). Related local expenditures are low, well distributed, and not significant to the local economy or to industrial business.

The ISA Complex does support private and commercial primitive recreation use. Judging from the points of origin, approximately 85 percent of the users pass through San Juan County's service centers. The actual amount of income generated locally from recreational use in the ISA Complex is unknown. However, an approximate range of expenditures can be deduced (Dalton, 1982). This study indicated that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for Grand Gulch ISA Complex is estimated to average about 20,000 visitor days per year, for a total estimated income of $82,000. Only a portion of the expenditures for recreational use of the ISA Complex contributes to the local economy of San Juan County.

For the most part, these recreation-related expenditures are well distributed within the local economy and are of low significance to any individual business. The six commercial outfitters who make use of the ISA Complex, none of which are locally based, could be an exception, since commercial use of the ISA Complex accounts for an estimated $26,000 of annual sales. Several commercial outfitters also make some incidental use of the ISA Complex from San Juan River boat trips.

The ISA Complex generates revenues to the Federal Treasury from three sources: mineral leases, grazing fees, and recreation use permits (refer to Table 12). Within the ISA Complex, about 60,260 acres are currently leased for oil and gas. At $3 per acre, this generates up to $180,780 annually. Half of this, or up to $90,390, is allocated back to the State of Utah. The State then reallocates these revenues to various funds, the majority of which are related to energy development. Based on 1,930 AUMs of forage consumed annually by livestock in the ISA Complex at the current grazing fee of approximately $1.40 per AUM, the Complex annually accounts for $2,702 of grazing fee revenues to the Treasury. Half of this is allocated back to the local BLM district for construction of rangeland improvements. The recreation land use permit fees of $1.00 per user day for commercial use of the ISA Complex generate about $1,500 of revenues annually.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Future users in the ISA Complex would meet requirements of all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs and ISAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs and ISAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown, but would probably be low due to the rough terrain and low resource potential. The following is a worst-case analysis, based on the assumption that oil or gas would be developed sometime in the future, resulting in up to 85 acres of surface disturbance. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.) No surface disturbance related to development of other mineral resources is anticipated. An additional 4,680 acres would be disturbed for chainings and/or seedings under this alternative. The total disturbance in the ISA Complex could be up to 4,765 acres, primarily on the mesas surrounding the canyons.

AIR QUALITY

The ISA Complex would continue to be managed as a PSD Class II area. Total disturbance of 4,765 acres would result in minor temporary increases in fugitive dust emissions. Because no major sources of air pollutant emissions are proposed in the vicinity of the ISA Complex, air quality would remain essentially as at present.

GEOLOGY

No impacts to geology are expected because oil and gas exploration and development activities would probably not exceed 85 acres and would involve surface disturbances and widely spaced wells that would not change the geologic structure of the area.

SOILS

It is estimated that up to 85 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.51 cubic yard/acre/year. If disturbed, the soil loss would average 3.4 cubic yards/acre/year. Soil loss on the 85 disturbed acres would increase from 43 cubic yards/year to 289 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the ISA Complex due to oil and gas exploration and development would increase by approximately 246 cubic yards (.45 percent) over the current annual soil loss of 54,342 cubic yards to approximately 54,588 cubic yards per year.

Soils would also be disturbed from rangeland developments. The 4,680 acres of land treatments would be designed to improve ground cover and soil conditions. Ground cover would be disturbed

during the early implementation stages, increasing erosion during the short term. BLM experience in the affected area indicates that the plant density existing before treatment would be achieved in about 4 years (USDI, BLM, 1982b).

The opportunity to dry farm some of this ISA Complex would not be foregone under this alternative. There is no current plan to use any of these lands for agricultural purposes.

VEGETATION

Astragalus cottamii, Astragalus monumentalis, Erigeron kachinensis, and *Zigadenus vaginatus*, all sensitive plant species currently being reviewed by the FWS for possible threatened or endangered status, may be found within or near the ISA Complex. Before authorizing surface-disturbing activities (85 acres from oil and gas development, 4,680 acres from potential land treatments, and additional disturbance from other planned rangeland developments, including reservoirs and spring developments) the BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, the BLM would initiate formal Section 7 consultation with the FWS under provisions of Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken to protect these plants, it can be reasonably concluded that the viability of populations of these sensitive plant species would be preserved within the ISA Complex under the No Action Alternative.

No major changes in the vegetation types of the ISA Complex would result from the more than 4,765 acres of potential disturbance. Total disturbance would be less than 5 percent of the ISA Complex.

WATER RESOURCES

Since precipitation is low and there are no naturally occurring surface water sources within the ISA Complex, no significant sedimentation or change in total dissolved solids (TDS) is expected to occur from as much as 246 cubic yards of annual soil loss from surface disturbance. Oil and gas exploration and development in the area would generally be confined at or near the surface or with widely spaced wells and would not significantly change ground water quantity or quality. The good quality of the area's 23 known springs would not be affected. Opportunities for future water developments exist under this alternative, but none are planned in the current MFP, except rangeland improvements for livestock.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

The potential for up to 10 million barrels of oil and up to 60 billion cubic feet of natural gas (in-place) exists within the ISA Complex. Up to 3 million barrels of oil and 18 billion cubic feet of gas would be recoverable. These oil and gas resources could be explored and developed, subject to Category 2 (special stipulations) on about 41,172 acres and Category 3 (no surface occupancy) on about 15,165 acres. Approximately 49,183 acres would continue to be closed to leasing. Because much of the area would be managed as no surface occupancy or closed to leasing, the operator's ability to explore and develop the area would be limited.

It cannot be determined how much of the potentially recoverable resource of 3 million barrels of oil and 18 billion cubic feet of natural gas is within the area that would remain closed to leasing under this alternative. Assuming that the loss of potential resource recovery would be in direct proportion to the size of the area open to leasing, exploration and development of a potential resource of up to 1.4 million barrels of oil and 8.5 billion cubic feet of gas could be foregone. Approximately 85 acres of surface disturbance would take place if exploration and development were to occur. Due to the small size of these potential deposits, as well as the restrictive stipulations throughout the area, significant production is not expected under this alternative.

Locatable Minerals

The entire ISA Complex would remain open to mining claim location. There are no claims, and no locatable mineral deposits are projected to occur in this ISA Complex. Therefore, no exploration or development is likely.

WILDLIFE

As much as 85 acres of surface disturbance could occur from oil or gas exploration and development under this alternative. Generally, the effect of such disturbance would be negligible to wildlife. This disturbance could occur within the 3,900 acres of crucial yearlong desert bighorn habitat and the 2,900 acres of crucial deer winter range, reducing these habitats by as much as 4 percent during the period of disturbance. Reclamation could result in the habitat being improved over the long term. Mobile animals such as mule deer would leave the area of disturbance, and less

mobile animal populations would be reduced during the time of disturbance. Prior to any disturbance, BLM would initiate Section 7 consultation with the FWS concerning the blackfooted ferret and bald eagle (both endangered), as required by the Endangered Species Act and BLM policy. The BLM would request a biological opinion when appropriate (refer to Appendix 4). Because necessary measures would be taken to protect these species, it can be reasonably concluded that the viability of any population of these species in the ISA Complex would be preserved under the No Action Alternative. There are no Federally designated critical habitats that could be affected. Potential bighorn sheep transplants in the ISA Complex would be allowed; however, none are proposed or likely to occur in the foreseeable future.

The livestock improvements planned for the area would result in improved water and forage for wildlife. Additional vegetation manipulation projects or water developments to benefit wildlife would be allowable under this alternative, although no such improvements have been currently identified.

FOREST RESOURCES

Harvest of the woodland products in this ISA Complex would be allowed under this alternative, but use probably would not exceed current low levels due to limitations on resource potential and the topographic restraints on access, as well as the availability of the resource elsewhere. As in the past, future use would continue to occur on Cedar Mesa just outside the ISA Complex.

LIVESTOCK

Few, if any, changes in livestock use or management techniques are expected under this alternative. Domestic livestock grazing would continue as authorized (currently 1,930 AUMs involving seven permittees) in the South San Juan MFP or other applicable planning documents. Existing range developments (including three seedings [1,900 acres], 12 earthen reservoirs, three developed springs, and several miles of fence) could be used and maintained as in the past. Additional roads or livestock developments could be allowed in the future without regard for wilderness values. Currently planned projects that could be completed under this alternative include land treatments on 4,680 acres, seven reservoirs, one spring development, and 2.5 miles of water pipeline. The land treatments would result in 1,118 additional AUMs. These developments would allow for better livestock distribution in the ISA Complex. The possible 85-acre disturbance from oil and gas exploration and development would not reduce livestock forage significantly because it would involve less than 1 percent of the area.

VISUAL RESOURCES

Under this alternative, visual quality in the ISA Complex would be protected by limitations placed on potential surface-disturbing activities (i.e., 37,580 acres would continue to be closed to mineral location, 49,183 acres would be closed to oil and gas leasing, 15,165 acres would be managed as no surface occupancy, 37,580 acres would be managed under VRM Class I objectives where only natural changes are allowable, and 20,140 acres would be managed under VRM Class II objectives requiring that activities not be apparent).

Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual values in areas affected by the estimated 85 acres of surface disturbance from oil or gas activities would be degraded, and VRM Class I and II management objectives would probably not be met in disturbed areas during the short term. After rehabilitation, visual resources would be restored to meet VRM objectives. Even after mitigation and rehabilitation, some permanent localized degradation could result from energy-related exploration and development. Because of leasing stipulations, roads, vehicular ways, and drill pads would be limited to certain areas and the visual quality would not be significantly reduced in the area as a whole. The probability of extensive energy and mineral exploration and development is low. Rangeland developments, including land treatments, would also reduce visual quality in the affected areas, although the development would be designed to meet VRM objectives as much as possible.

CULTURAL RESOURCES

Under this alternative, disturbance of 85 acres from oil or gas exploration and development (including additional roads and ways for motorized access) as well as disturbance from proposed rangeland developments (4,680 acres of land treatments) could adversely affect cultural sites. However, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would lessen impacts. Also, mineral-related surface disturbance would be limited to the 41,172-acre area (39 percent of the ISA Complex) managed as leasing Category 2 (special stipulations); therefore, cultural values would be largely protected in the majority of the ISA Complex. However, some of the 580 recorded and 12,360 poten-

tial sites (8,240 of which could be potentially National Register eligible) could be in the disturbed areas and therefore inadvertently damaged. Vandalism of sites would be expected to increase in proportion to the general visitor increase, as well as any increase in roads from energy exploration. Experience in other portions of the Cedar Mesa area indicates a direct correlation between additional access and sites vandalized for illegal artifact collection purposes. However, ranger patrols, including helicopter surveillance, would continue to help control vandalism and theft of cultural resources.

Cultural site stabilization efforts and excavation could be completed without regard for wilderness considerations and would, therefore, be relatively easy to conduct under this alternative.

RECREATION

Primitive recreational opportunities and quality would be diminished on the 85 acres disturbed by mineral and energy activities and the 4,680 acres that would be disturbed by land treatments and other livestock developments. The energy-related disturbance would be largely limited to the 41,172-acre area that would be managed as leasing Category 2 (special stipulations). Roads and ways created for mineral exploration and development would improve access into the area for nonprimitive recreation. Approximately 15 miles of existing vehicular ways presently open to vehicular access, as well as new access roads and ways from energy exploration, would provide vehicular access for nonprimitive recreational uses. Motorized activities would be allowed, except in the Grand Gulch ISA (37,580 acres), and could conflict with nonmotorized uses where areas of use overlap.

The future increase in recreational use of the ISA Complex is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981), it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate, overall recreational use is expected to increase from the estimated 20,000 current visitor days per year to about 29,818 visitor days at the end of 20 years. Primitive recreational use would constitute nearly all of the estimated increase from the estimated current use. Recreational activities utilizing vehicular access (hunting, sightseeing, etc.), which is currently almost nonexistent, would increase only slightly to no more than 149 of the area's expected user days at the end of 20 years. ORV activity would increase only slightly due to a limited area suitable for ORV use. Commercial outfitting, currently about 10 percent of the area's use, would continue to be an important recreational factor in the area.

WILDERNESS VALUES

None of the Grand Gulch ISA Complex would be designated wilderness, and management would continue to be under the existing South San Juan MFP until superseded by the San Juan RMP. Wilderness values in this ISA Complex (i.e., naturalness, outstanding opportunities for solitude and primitive recreation, and special features including cultural and aesthetic values) would be lost or diminished in affected areas (as much as 85 acres) during the time of exploration and development. The wilderness values in the area as a whole would probably not be lost because disturbance from oil or gas development would be limited to the 41,172-acre area that would be managed as leasing Category 2 (special stipulations) and would not occur throughout the area. Although mineral location could occur, no development is likely due to the lack of locatable mineral resources in the area. Disturbance from future range developments (including land treatments on 4,680 acres, seven spring developments, seven reservoirs, and a 2.5-mile water pipeline) would occur, impacting naturalness and outstanding opportunities for primitive recreation in affected areas. Motorized use of the area would continue on 61,940 acres, including about 15 miles of existing ways, and potentially on future ways and would reduce solitude and primitive recreation opportunities.

LAND USE PLANS AND CONTROLS

Implementation of this alternative would be consistent with the BLM South San Juan MFP because land use would continue as at present. Not designating the ISA Complex as wilderness would not conflict with the *San Juan County Master Plan* because that Plan predates wilderness consideration. However, current mineral closures in the Grand Gulch Primitive Area, that would be continued with ONA or ACEC designation, are not consistent with San Juan County's multiple-use concept. This alternative would not complement the NPS' wilderness recommendation for lands in the contiguous Glen Canyon NRA. This alternative would not conflict with State of Utah plans and policies.

SOCIOECONOMICS

Overall, no changes in existing patterns or trends of population, employment, or distribution of local income would be expected.

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would be changed slightly because 3,923 acres of existing oil and gas leases would expire and would not be reissued. If the potential oil and gas resource in the ISA Complex were developed, it would lead to increased employment and income for San Juan County. However, the probability of economic development of minerals within the ISA Complex is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the existing grazing use (1,930 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present. The proposed 4,680 acres of land treatments that would produce 1,118 AUMs of new allocated forage could lead to $22,360 of livestock sales and $5,590 of ranchers' returns to labor and investment.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase from the current 20,000 visitor days per year to 29,818 visitor days per year 20 years from now and because overall recreation-related expenditures average $4.10 per visitor day (only a portion of which contributes to the local economy), recreation-related expenditures of up to $122,254 attributable to the Grand Gulch ISA Complex likely would be significant to individual businesses dealing in recreational equipment and services.

Federal and State revenues would be reduced slightly by this alternative. There are about 3,923 acres in the ISA Complex that are leased but will be closed to future leasing unless oil and gas is found in commercial quantities. If leases are not reissued, there would be a loss of up to $11,769 in revenues to the Federal Government. Half of these lost revenues would have been allocated to the State, a portion of which could have reached the local economy.

Collection of livestock grazing fees (approximately $2,702 per year) would continue. The additional 1,118 acres of forage that would be produced by proposed new range improvements and allocated to livestock under this alternative would increase Federal revenues by $1,565 annually. About 50 percent of the increased revenues would be returned to the local BLM office for use in range improvement projects.

All Wilderness Alternative (105,520 Acres) (Proposed Action)

As cited in the Description of the Alternatives section, the major changes that could occur in the 105,520-acre area would be related to withdrawal of an additional 67,940 acres from mineral location and closure to new mineral leasing and sale. The entire area would be placed in oil and gas leasing Category 4 (closed to leasing). About 15 miles of existing open vehicular ways in the ISA Complex would be closed to vehicular use except for approvals by BLM, as noted in the Description of the Alternatives section. The ISA Complex would be managed under VRM Class I.

For the following analysis, it is assumed that no mining claims would be filed in the ISA Complex prior to designation due to lack of locatable mineral potential. It is also assumed that the existing oil and gas leases would expire before production of commercial quantities and that oil and gas leases would not be renewed or future leasing of oil and gas allowed. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates for the ISA Complex.)

Because potentially disturbed areas from oil and gas and livestock development would be smaller than under the No Action Alternative (0 vs. 4,765 acres), the anticipated impacts from disturbance to air quality, geology, soils, water resources, forest resources, livestock, and wildlife for the All Wilderness Alternative would be less than the generally insignificant impacts described for the No Action Alternative. Wilderness designation would provide additional protection to these resources. Other effects on these resources due to changes in management are addressed below.

SOILS

Overall, the soil resource would benefit under the All Wilderness Alternative because mineral- or energy-related surface-disturbing activities are not anticipated under this alternative. Soil loss from erosion could be expected to continue at current rates (54,342 cubic yards annually) within the ISA Complex. This is 246 cubic yards per year (.45 percent) less soil loss than under the No

Action Alternative. The 4,680 acres of land treatment would not occur under this alternative; therefore, increased erosion during the short term and less erosion over the long term from such treatment would not occur under this alternative.

VEGETATION

There would be no change in vegetation types under this alternative. Inadvertent disturbance of *Astragalus cottamii, Astragalus monumentalis, Erigeron kachinensis*, and *Zigadenus vaginatus*, all sensitive plant species, would be unlikely with implementation of this alternative because mineral-related disturbances would probably not occur and the 4,680-acre planned land treatment and seven planned earthen reservoirs would not be developed. Before authorizing allowable surface-disturbing activities (one spring development and a 2.5-mile pipeline planned) the BLM would conduct site-specific clearances of the potentially disturbed areas, consult with the FWS, and implement mitigating measures as described for the No Action Alternative. Because necessary measures would be taken to protect these plants, it can be reasonably concluded that the viability of populations of threatened, endangered, or sensitive plant species would be preserved under the All Wilderness Alternative.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Although 60,260 acres of the ISA Complex are under oil and gas lease (53,040 acres of existing leases are pre-FLPMA and 7,220 acres are post-FLPMA), no exploration or development of oil and gas is presently occurring within the ISA Complex.

Existing pre- and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases will be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases will not be reissued. Exploration for and development of a potentially recoverable resource of less than 3 million barrels of oil or less than 18 billion cubic feet of natural gas would be foregone under this alternative. The loss would only be about 1.6 million barrels of oil and 9.5 billion cubic feet of natural gas over No Action Alternative. Due to the small size of the potential deposits and the low certainty that they exist, it is concluded that this alternative would not result in any significant loss of potential oil and gas recovery.

Locatable Minerals

There are no mining claims currently located within the ISA Complex, and it is unlikely that any would be located prior to wilderness designation. Should any be located prior to designation, development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation under unnecessary or undue degradation guidelines with consideration given to wilderness values. After designation, all lands in the ISA Complex (including claims not determined valid) would be closed to mineral entry (USDI, BLM, 1981).

Because mineral production is not currently occurring and the area has no known potential for locatable minerals, implementation of this alternative would not result in a significant impact to locatable mineral recovery.

WILDLIFE

Overall, wildlife would benefit from the elimination of 85 acres of energy-related surface disturbance that could occur under the No Action Alternative. Habitat for blackfooted ferret and bald eagle and crucial habitats for mule deer and bighorn sheep would be protected from surface disturbance. Prior to development of the proposed spring development and the 2.5-mile pipeline that likely would be allowable under this alternative, the BLM would conduct site-specific clearances of the potentially disturbed areas. If these species could be affected, the BLM would initiate Section 7 consultation with the FWS as required by the Endangered Species Act and BLM policy. The BLM would request a biological opinion when appropriate (refer to Appendix 4). Because necessary measures would be taken to protect these animals, it can be reasonably concluded that the viability of populations of endangered animal species would be preserved under the All Wilderness Alternative.

The 4,680-acre land treatment and seven earthen reservoirs that would result in improved water and forage would be foregone under this alternative. Wildlife would benefit from the spring development that probably could be built under this alternative. Potential bighorn sheep transplants would be allowed, although none are currently planned.

FOREST RESOURCES

Under this alternative, no woodland harvest would occur. The potential harvest of up to 12,280 cords of fuelwood in the Grand Gulch ISA Complex would be foregone with wilderness designation. This would not be a significant impact to

recovery of woodland products due to limited existing and potential use in the ISA Complex and the availability of woodland products elsewhere in the Cedar Mesa area.

LIVESTOCK

Grazing use would continue with no substantial change. The seven operators with cattle and/or cattle and horse use could continue grazing of the estimated 1,930 AUMs in the four allotments within the ISA Complex. The existing range projects (three springs, 12 earthen reservoirs, 1,900 acres of seedings, and several miles of fence) would continue to be used and maintained as in the past based on practical necessity and reasonableness. Development of seven proposed earthen reservoirs and 4,680 acres of land treatment would be foregone under this alternative, although the proposed spring development and 2.5 miles of water pipeline probably could be constructed. Livestock distribution would benefit from development of the allowable rangeland improvements, but the benefits of increased AUMs and improved livestock distribution that could be gained with the land treatment and reservoirs would be foregone. Closure of existing ways would inconvenience some operators who use existing ways for livestock management.

VISUAL RESOURCES

Wilderness designation would result in the preservation of the area's high quality visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through closure of the entire area to ORV use, and through closure of the area to future mineral leasing and location. No visual resource impacts from mineral or energy exploration or development would be expected under this alternative. Development of one spring and a water pipeline would result in minor degradation to visual quality, but developments would be designed to meet VRM quality standards.

CULTURAL RESOURCES

Wilderness designation for the ISA Complex would benefit cultural resources by limiting the amount of surface-disturbing activity (especially additional roads) and by restricting motorized access. Experience in other portions of this resource area indicates a direct correlation between additional access and sites vandalized for illegal artifact collection. The 580 recorded and 12,360 potential sites (8,240 of which are potentially National Register eligible) would thus be protected.

Additional visitation into the ISA Complex has the potential for accelerated deterioration of the more accessible cultural sites. However, ranger patrols, including helicopter surveillance, would continue in order to help control vandalism and theft of cultural resources. Stabilization and scientific excavation would be allowed but would have to be carried out in a manner compatible with the wilderness setting. Still, the protection afforded by wilderness management would outweigh problems from increased recreational activity and restrictions on cultural resource management.

RECREATION

Use is currently high (approximately 20,000 visitor days per year), and the ISA Complex has outstanding primitive recreational values. If designated, the opportunities for hiking, backpacking, and horseback riding, in combination with sightseeing and cultural resource study, would be further recognized. As discussed for the No Action Alternative, recreational use of the ISA Complex is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the area that would likely follow wilderness designation could lead to an increase in primitive recreational use above the baseline rate. Judging from use densities of a number of well known wilderness areas and primitive areas in the region, the ISA Complex's site characteristics, the population distribution about the ISA Complex, and the availability of similar sites, it is estimated that use after designation could be as much as 31,656 visitor days per year. This is 11,656 visitor days (58 percent) over the area's current estimated annual visitor use. Management provided through a Wilderness Management Plan would control destructive increases in future recreation use, and it is unlikely that the quality of the primitive recreation experience would be negatively affected by the increased use. Use of ORVs in the Grand Gulch ISA Complex is minimal, and closure of the ISA Complex to vehicle use would result in little change from the current situation. Commercial outfitting would benefit from wilderness designation because opportunities for commercial enterprise are good.

WILDERNESS VALUES

The wilderness values of naturalness and outstanding opportunities for primitive recreation on 105,520 acres and solitude on 103,920 acres would be protected through wilderness designation of this ISA Complex.

These wilderness values would be enhanced due to the restrictions on surface-disturbing activities and motorized uses. No surface disturbance from mineral development and only minor disturbance from rangeland improvements is anticipated under this alternative. Motorized access into the ISA Complex would be closed to general vehicle use.

Wilderness designation on 105,520 acres would also protect the special features present. The 580 recorded and 12,360 potential archaeological sites would be protected, as would the historic and scenic values.

Recreational use of the ISA Complex could be as much as 31,656 annual visitor days after wilderness designation (which is a 58-percent increase over the current estimated 20,000 annual visitor days), a 9-percent increase over the predicted future use with the No Action Alternative. This increase in use would probably not decrease opportunities for solitude and primitive recreation because of the large size of the ISA Complex and many canyons involved. Also, the management plan for the area could control visitation and focus on dispersed use opportunities.

LAND USE PLANS AND CONTROLS

The existing BLM South San Juan MFP does not provide for wilderness designation. The forthcoming San Juan RMP will acknowledge the wilderness study but will not cover wilderness designation. Congressional designation of the ISA Complex as wilderness would be an amendment to the applicable BLM land use plan.

The *San Juan County Master Plan* emphasizes multiple use of all public lands in the county and zones this area as open range and forest lands. The All Wilderness Alternative would not totally conflict with the County's multiple-use concept since most resource uses would continue, although under more restrictive conditions. However, this alternative would partially conflict with the County's multiple-use concept because restrictive conditions would be placed on 105,520 acres, including 67,940 acres currently open to mineral development. If State lands within the ISA Complex (2,400 acres) and one isolated State section adjacent to the ISA Complex (640 acres) are exchanged for lands outside the ISA Complex, wilderness designation would not conflict with the State of Utah policy to maximize economic returns.

This alternative would be consistent with the NPS wilderness recommendation for lands in the contiguous Glen Canyon NRA.

SOCIOECONOMICS

Overall there would be no significant changes in current trends of population, employment, and local income distribution.

Because existing leases would not be reissued under wilderness designation, there would be losses in Federal revenues currently provided by oil and gas leases in the ISA Complex (refer to Table 12). Valid existing oil and gas leases could be developed, but designation would preclude new leases and claims from being established in the ISA Complex. Precluding exploration and development of energy and mineral resources would not alter existing economic conditions, but could alter future economic conditions from what they would be with mineral development under the No Action Alternative. Because the potential for mineral development is low, it is estimated that potential mineral-related local income would not be significantly reduced by wilderness designation. However, local income related to assessment of any future mining claims would be lost, although the probability for such claims is very low.

Livestock use and ranchers' income would continue as at present with $38,600 of livestock sales and $9,650 of ranchers' return to labor and investment. The proposed 4,680 acres of land treatments would be foregone, along with any resulting increase in ranchers' income. If this project were not implemented and the additional 1,118 AUMs not used, ranchers' annual increased returns to labor and investment foregone would be up to $5,990 and the increase in livestock sales foregone each year would be $22,360.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section). Designation could result in an increase in recreational use of as much as 31,656 annual visitor days. Related local expenditures would average $4.10 per visitor day for an annual total of up to $129,790 and would be significant to individual businesses providing recreational equipment and services, to the commercial outfitters who now use the ISA Complex, and to those outfitters that may begin to use the ISA Complex. Motorized

recreational use of the ISA Complex is currently light, and any decrease in related local expenditures due to ORV closure would be small and insignificant to both the local economy and individual businesses.

Recreation-related Federal revenues (presently about $1,500 annually) could increase if the demand for commercial outfitter services increases. There are presently six commercial outfitters using the ISA Complex; designation could lead to more commercial recreational use in the ISA Complex.

The loss of 56,337 acres that could be leased under the No Action Alternative could cause the eventual loss of up to $169,011 per year of lease fees to the Federal Treasury. In addition to these lease fees, any potential royalties from lease production could also be foregone.

Wilderness designation would eliminate most woodland product harvesting and related Federal revenues. There are few, if any, revenues from this source.

Partial Wilderness Alternative (37,580 Acres)

The major activities that would occur in the designated portion of the ISA Complex for this alternative are the same as described for the All Wilderness Alternative. For the nondesignated portion, management would be as described for the No Action Alternative. The specific actions that would take place within the 37,580-acre area that would be designated as wilderness and the 67,940-acre nondesignated area are discussed in the Description of the Alternatives section.

There are no existing oil and gas leases nor mining claims in the area that would be designated wilderness. This area is currently designated as the Grand Gulch Primitive Area and is closed to mineral location and leasing as well as to ORV activity. It is currently managed as VRM Class I. Wilderness designation essentially would result in continuation of the current management situation although it would be somewhat more restrictive. Additionally, wilderness would be a statutory designation much less subject to change than the current administrative designation and management under a land use plan. No disturbance would be anticipated in the designated area.

It is assumed that, within the nondesignated area, up to 85 acres would be disturbed sometime in the future due to oil and gas exploration and development. In addition, 3,600 acres of proposed land treatments in this area would be allowed. In total, there could be 3,685 acres of surface disturbance that could occur within the ISA Complex. This would be 1,080 acres less than under the No Action Alternative and 3,685 acres more than with the All Wilderness Alternative. (Appendix 10 lists the mineral-related surface disturbance assumptions and estimates for the ISA Complex.)

Impacts under this alternative would be similar to those with the No Action Alternative. The following analysis describes only measurable differences between this alternative and the All Wilderness and No Action Alternatives.

WILDLIFE

Wildlife would benefit due to the preservation of naturalness and solitude within the designated area (36 percent of the ISA Complex). As much as 85 acres of disturbance could occur from oil and gas exploration and development in the undesignated portion of the ISA Complex. As with the No Action Alternative, the effect of this disturbance would generally be negligible to wildlife habitat and populations. This disturbance could occur within the 3,900 acres of crucial yearlong desert bighorn sheep habitat and the 2,900 acres of crucial deer winter range, reducing these habitats by as much as 4 percent during the period of disturbance. Reclamation could result in the habitat being improved over the long term. Appropriate measures would be taken to protect bald eagle and blackfooted ferret prior to surface-disturbing activity, and it can be assumed that no impact would occur to these endangered species.

The six reservoirs and 1,080 acres of land treatments proposed for the wilderness portion of the ISA Complex would probably not be constructed under this alternative and resulting benefits to wildlife would be foregone.

LIVESTOCK

Wilderness designation of 37,580 acres of the ISA Complex would impact domestic livestock grazing as described for the No Action Alternative. Use allocations would continue as determined by the current plan for the area. Of the 1,930 AUMs presently allocated, approximately 259 AUMs (13 percent) would be within the designated portion of the ISA Complex and 1,671 AUMs within the nondesignated portion. In the wilderness portion there are one existing reservoir, one existing spring development, and 0.3 mile of fence that could continue to be used and maintained as in the past based on practical necessity and reasonableness. Other existing range developments, including 11 reservoirs, several seedings totaling

1,900 acres, two spring developments, and several miles of fence, are outside the wilderness portion of the ISA Complex and could be used and maintained without wilderness considerations.

Development of future roads or other livestock management facilities in the designated portion would be restricted to preserve wilderness values. Approximately 1,080 acres of land treatments and six reservoirs currently planned within the area that would be designated wilderness would not be developed under this alternative. The 0.3 mile of pipeline currently proposed in the wilderness portion of the ISA Complex would probably be developed. In the nondesignated portion of the ISA Complex, the one reservoir, one spring development, 2.2 miles of pipeline, and 3,600 acres of land treatment currently proposed could be developed without wilderness considerations. Land treatments in the ISA Complex could generate an 860 additional AUMs under this alternative, compared with 1,118 AUMs under the No Action Alternative. This would mean a potential 258 AUMs foregone. This alternative would result in less opportunity to improve livestock distribution and forage. Of the 30 miles of existing vehicular ways, 15 miles are within the area that would be designated. These are currently closed to vehicular access; therefore, continuation of this closure would not inconvenience livestock operators in the area.

VISUAL RESOURCES

Because total surface disturbance in the ISA Complex could be as much as 3,685 acres under this alternative, as opposed to 4,765 acres under the No Action Alternative and none under the All Wilderness Alternative, the potential for impact to visual resources would be slightly less than under the No Action and substantially more than under the All Wilderness Alternative. All of the area that would be designated wilderness and managed as VRM Class I is high quality (Class A) scenery. No surface-disturbing activities (except .3 mile of water pipeline) would occur in this area and the visual quality of the area would be preserved. There are 19,000 acres of Class A scenery in the portion of the ISA Complex not designated that would be managed as VRM Class II. Although mitigating measures would be applied to reduce visual contrast created by oil and gas related surface disturbance, visual quality would be degraded and VRM Class II management objectives would not be met during the short term on disturbed areas. Even after rehabilitation, some permanent localized degradation could be expected. Although livestock developments would be designed to meet VRM objectives, some reduction in visual quality could be expected. Because of protection to visual resources of the ISA Complex, even outside the portion designated wilderness (11,603 acres closed to leasing, 15,165 acres no surface occupancy and 20,140 acres managed as VRM Class II) and because the area has little potential for oil and gas and no potential for locatable minerals, it is likely that visual resources would remain similar to present conditions in the area as a whole.

RECREATION

Impacts on recreational values and opportunities for the ISA Complex under this alternative are as described for the No Action Alternative. The 37,580-acre area that would be designated wilderness under this alternative is already well known as a Primitive Area, and designation as wilderness would have little effect on increasing visitor use over that which would occur with the No Action Alternative.

WILDERNESS VALUES

Impacts to wilderness values would be the same as under the All Wilderness Alternative on the 37,580 acres that would be designated wilderness. Wilderness designation would ensure preservation of the wilderness values of size, naturalness, and outstanding opportunities for solitude and primitive recreation which are included in the entire 37,580 acres. Excellent examples of scenic and cultural values occur in this portion of the ISA Complex. In the designated area, the potential for surface-disturbing activities that could impair wilderness values would continue to be reduced through management under VRM Class I (which generally allows for only natural ecological change), through continuation of the ORV closure, and through continuation of closure to future mineral leasing and location. No surface disturbance (except .3 mile of water pipeline) would be expected. Solitude and primitive recreation values would be expected to continue.

In the 67,940-acre area that would not be designated, there would be as much as 85 acres of disturbance from energy exploration and development and 3,600 acres of disturbance due to planned land treatments, as well as disturbance related to development of one spring, one reservoir and 2.2 miles of water pipeline. These activities would degrade wilderness values in localized parts of the area from the commencement of activities through rehabilitation. Still, because of protection given the visual resource of the ISA Complex, even outside the portion that would be

designated wilderness (11,603 acres closed to leasing, 15,165 acres no surface occupancy, and 20,140 acres managed as VRM Class II), and because the area has little potential for oil and gas and no potential for locatable minerals, wilderness values in the ISA Complex as a whole would likely remain unchanged, even with wilderness designation on only 37,580 acres.

LAND USE PLANS AND CONTROLS

Although some existing uses would continue in the designated wilderness, designation of 37,580 acres in the Grand Gulch ISA Complex would not be consistent with San Juan County's concept of multiple use because of restrictions on mineral development. Nondesignation of 67,940 acres would be consistent with the County's multiple-use concept. The Master Plan does not specifically address wilderness in the Grand Gulch area. Although the current BLM Primitive Area designation and the No Action Alternative contain many of the same limitations as would be applied on the 37,580-acre wilderness area, the formal designation by Congress could be viewed as more restrictive and inconsistent with the County's multiple-use concept than the somewhat similar management provided under BLM land use plans.

SOCIOECONOMICS

With partial designation there would not be significant changes in current trends of population, employment, and local income distribution.

Because of restrictions placed on the use of resources under the Partial Wilderness Alternative, there would be loss of potential increases in livestock-related income and Federal revenues that could otherwise occur under the No Action Alternative. For most socioeconomic concerns, there would be no difference between this alternative and the No Action Alternative.

There are no existing leases or claims in the Primitive Area portion of the ISA Complex and wilderness designation of the 37,580 acres in the areas would preclude new leases and claims from being established. Precluding exploration and development of energy and minerals would not alter existing economic conditions or future economic conditions from what they would be as described under the No Action Alternative (refer to Mineral and Energy Resources section for a discussion of the ISA's mineral character). Because the potential for mineral development is low, it is estimated that potential mineral-related local income would not be significantly affected by the Partial Wilderness Alternative.

The additional 860 AUMs of forage that would be produced by 3,600 acres of land treatments under this alternative could lead to $17,200 of livestock sales and $4,300 of ranchers' returns to labor and investment under this alternative. If allocated to livestock, Federal revenues would increase by $1,204 annually (at $1.40 per AUM). The potential AUMs foregone would result in corresponding income ($5,160) and Federal revenue ($361) increases foregone.

The Grand Gulch Primitive Area is already well known and public awareness of the area resulting from designation would probably not increase nonmotorized recreation use to a significant degree; therefore, related local expenditures would be essentially the same as the No Action Alternative.

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Road Canyon WSA

ROAD CANYON WSA
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ROAD CANYON WSA
(UT-060-201)

INTRODUCTION

General Description of the Area

Road Canyon Wilderness Study Area (WSA) is located approximately 10 miles north of Mexican Hat, San Juan County, Utah. The WSA, containing 52,420 acres, is approximately 9 miles long and 10 miles wide at the widest point, with a "cherry-stemmed" boundary road cutting approximately 7 miles into the mid-portion of the area.

The area is situated along the southeast portion of the Grand Gulch Plateau and contains Road Canyon, Lime Creek, the West Fork of Lime Creek drainages, and a portion of Cedar Mesa. Elevations range from 6,500 feet in the northeast to 4,700 feet in the southeast. Vegetation consists largely of desert shrubs and pinyon-juniper.

The principal feature of the WSA is its steep canyon walls, cross-bedded sandstone, and lower talus slopes with various erosional formations such as knobs, pinnacles, buttes, overhangs, arches, and alcoves.

Annual precipitation ranges from 6 inches to 12 inches over the Road Canyon WSA. January, May, and June are the driest months. July, August, and December are the wettest months. Annual total snowfall ranges from 10 to 40 inches. Average high temperatures in the Road Canyon WSA range from 65 to 70 degrees Farenheit (F), while average low temperatures are between 37 and 42 degrees F. The record high is 102 and the record low is -2 degrees F.

Road Canyon WSA is contiguous with the Fish Creek Canyon WSA to the north; however, they are separated by a county road.

Specific Issues Identified in Scoping

General issues pertaining to more than the Road Canyon WSA are discussed in Volume I. Issues and concerns raised in public scoping meetings (USDI, BLM, 1984c) and specific to the Road Canyon WSA are responded to below:

1. *Comment:* What would the effect of wilderness designation be on oil and gas leasing and development and mining claims?

   Response: The effect of wilderness designation on oil and gas leases and on mining claims is analyzed in this document. There would be little effect on pre-FLPMA (Federal Land Policy and Management Act) leases and valid claims filed prior to designation; otherwise energy and mineral development would be strictly limited or not allowed.

2. *Comment:* The WSA is a valuable wood-gathering area for Indians and others. There were 323 free-use firewood permits issued in 1981.

   Response: This information is noted in the Affected Environment, Forest Resources section; however, the 323 permits were for the entire San Juan Resource Area, which covers nearly all of San Juan County. An unknown (but small) percentage of this use was in the Road Canyon area, mostly along the roads to Snow Flat and Cigarette Point.

3. *Comment:* There are portions of four grazing permits within the area, with 22 existing improvements and five proposed improvements.

   Response: The Affected Environment, Livestock section identifies the four livestock grazing allotments and the 22 existing livestock developments. A fence and an 1,800-acre vegetation manipulation project are the only proposed projects.

4. *Comment:* There are several miles of roads, including 7 miles of "cherry-stemmed" boundary roads.

   Response: The Environmental Impact Statement (EIS) discussion identifies about 10 miles of road that are "cherry-stemmed" and, therefore, not contained within the Road Canyon WSA.

5. *Comment:* Human imprints are of minor impact and substantially unnoticeable, yet are used as rationale for a partial recommendation. Why?

   Response: During EIS scoping, BLM presented a preliminary indication of areas considered suitable or unsuitable for wilderness designation. For each WSA, this was based on site-specific analysis drafted in one of the five

Utah BLM districts. The indication of suitability was made public prior to the EIS to obtain further input which has assisted in the formulation of the EIS alternatives. Additional input is expected as a result of the public review and comment on the Draft EIS. At the conclusion of the EIS process, BLM will review and consider all of the information received and, at that time, will formulate a final recommendation of areas found suitable for wilderness designation. Rationale for such recommendations will be included in a Wilderness Study Report to be submitted to the Secretary of the Interior and, subsequently, to Congress. The rationale will be keyed to the criteria of the "Wilderness Study Policy" (USDI, BLM, 1982a) and to other resource management factors generally as described in Chapter 2, Volume I of this EIS.

6. *Comment:* Both the recommended and excluded areas contain equal scenic and cultural values. The sights and sounds from roads in the Valley of the Gods would not be significant because they are seldom traveled. The BLM recommendation is based on weak, inconsistent arguments.

Response: Refer to the response to the previous comment.

7. *Comment:* The canyons in the WSA are the most scenic parts of the entire Lime Creek drainage and are easily accessible prime dayhiking areas.

Response: This information has been included in the Affected Environment, Recreation section.

8. *Comment:* How would wilderness designation affect private and State in-holdings?

Response: The Affected Environment and Environmental Consequences, Land Use and Plans and Controls sections identify and discuss any conflicts with land use plans. There are no private in-holdings in the Road Canyon WSA. There are approximately 1,120 acres of State in-holdings. The analysis is based on the assumption that existing State lands would be exchanged out of any area designated wilderness.

9. *Comment:* Would wilderness designation be consistent with local and State land use plans?

Response: Refer to the response to the previous comment.

10. *Comment:* The manageability problem is not any greater here than in any other WSA.

Response: BLM believes that some WSAs would be more difficult to manage as wilderness than other WSAs, depending on terrain, existing access and off-road vehicle (ORV) use, in-holdings, and other such characteristics. The Road Canyon WSA contains some factors that could influence manageability. The subject of manageability is addressed in Volume I and will be further addressed during preparation of the Wilderness Study Report for submittal to Congress.

11. *Comment:* The Site-Specific Analysis (SSA) cites manageability as a reason for deleting 29,200 acres, yet impacts to energy and mineral development would not be significant. Only the access potential to oil and gas leases, however unlikely, is addressed by the Partial Wilderness Alternative.

Response: Refer to the responses to the previous comment and Comment No. 5 listed above.

12. *Comment:* The SSA rationale for deleting a large portion of the WSA was unjustified in view of the significant wilderness values (e.g., archaeological) in the deleted portions that would benefit from designation.

Response: Refer to the response to Comment No. 5 listed above.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated From Detailed Study

No alternatives were identified for the WSA during scoping other than those analyzed.

Alternatives Analyzed

Four alternatives are analyzed for this WSA: (1) No Action; (2) All Wilderness (52,420 acres); (3) Partial Wilderness (45,720 acres); and (4) Partial Wilderness (23,220 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 52,420-acre

Road Canyon WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the South San Juan Planning Unit Management Framework Plan (MFP) (USDI, BLM, 1971a) until that plan is superseded by the San Juan Resource Area Resource Management Plan (RMP) scheduled for completion in 1986. The 1,920 acres of State land within the WSA (refer to Map 1) have not been identified in the MFP for special Federal acquisition through exchange or purchase. No private or split estate lands are located in the WSA.

The following are specific actions that would take place under this alternative:

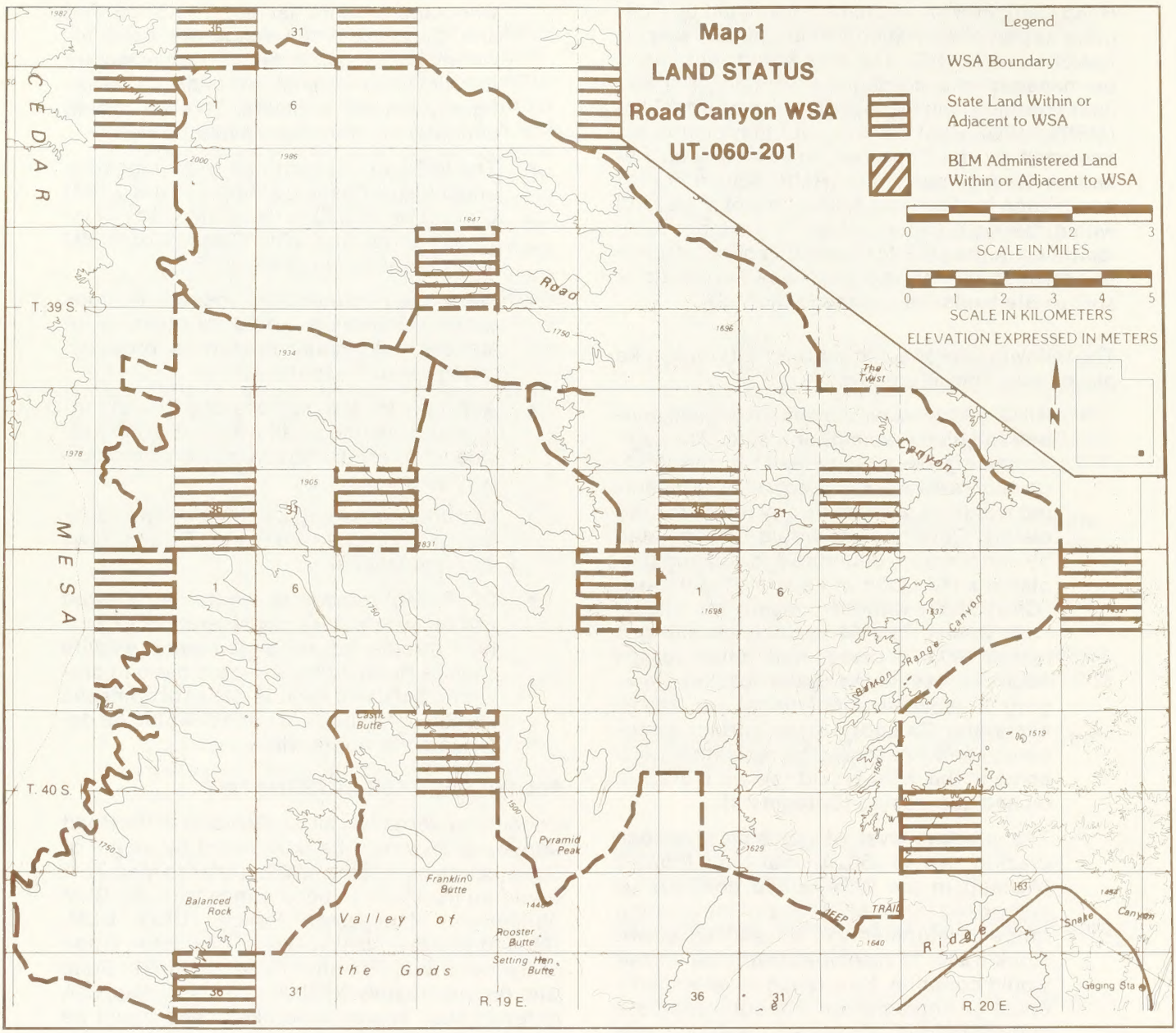
- All 52,420 acres would remain open to mineral location, leasing, and sale. Although no mining claims now exist in the WSA, development work, extraction, and patenting would be allowed on any future mining claims. Development would be regulated by unnecessary or undue degradation regulations (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. The 64 existing oil and gas leases (50,870 acres) and future leases could be developed under leasing Category 2 (special stipulations) on 44,450 acres and Category 3 (no surface occupancy) on 6,420 acres. The remaining 1,550 acres in the WSA would remain closed to oil and gas leasing (Category 4).
- The present level of domestic livestock grazing use (1,450 Animal Unit Months [AUMs]) in the WSA would continue as authorized in the MFP. Use of the existing range developments (6 miles of fence, two stock trails, 13 reservoirs, and one corral) would continue. New range developments could be implemented without wilderness considerations. Proposed developments include .50 mile of fence and 1,800 acres of land treatment.
- Use, maintenance, and development of facilities and improvements for wildlife, water resources, etc. could be allowed if in conformance with the MFP. There are no existing or planned wildlife management facilities or water developments in the WSA.
- The WSA would remain open to ORV use. New access roads could be planned and developed without consideration of wilderness values.
- The entire WSA would remain open to woodland product harvest. The Snow Flat and Cigarette Point roads are used for woodland harvest. Amounts harvested are thought to be minimal, although actual use figures are not available. This use would continue into the foreseeable future.
- The WSA would continue to be managed under Visual Resource Management (VRM) Class II on 28,830 acres, VRM Class III on 19,400 acres, and VRM Class IV on 4,190 acres as indicated in the MFP.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting and fishing would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness consideration to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

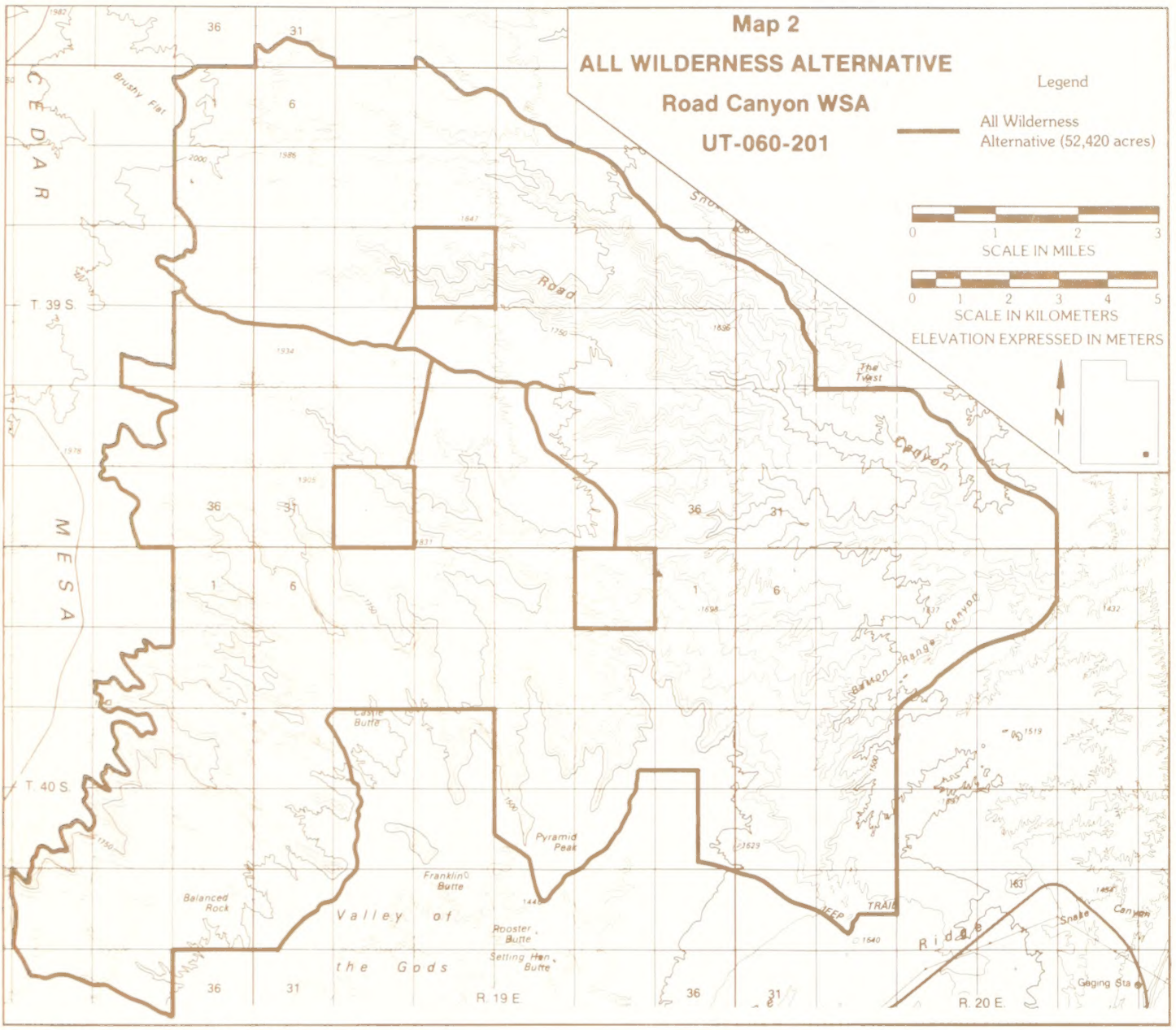
ALL WILDERNESS ALTERNATIVE

Under this alternative, all 52,420 acres of the Road Canyon WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. Upon designation, acquisition of three sections of State land (approximately 1,920 acres) within the WSA (refer to Map 1) would be likely, and could be authorized by purchase or exchange (refer to Appendix 3). Four of twelve State sections adjacent to the WSA likely would be exchanged. Should land transfers be made, it is assumed that management and types of impacts to former State in-holdings would be the same as those on adjacent Federal lands and no specific analysis is given here. The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 52,420 acres would be withdrawn from mineral lo-


Map 1
LAND STATUS
Road Canyon WSA
UT-060-201
Legend
WSA Boundary
State Land Within or Adjacent to WSA
BLM Administered Land Within or Adjacent to WSA
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
CEDAR MESA
T. 39 S.
T. 40 S.
R. 19 E.
R. 20 E.
Road
Canyon
Pyramid Peak
Franklin Butte
Balanced Rock
Valley of the Gods
Rooster Butte
Setting Hen Butte
Ridge
Snake
Geging Sta


Map 2
ALL WILDERNESS ALTERNATIVE
Road Canyon WSA
UT-060-201
Legend
All Wilderness Alternative (52,420 acres)
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
CEDAR MESA
Brushy Flat
Road
Canyon
Barker Ranger Canyon
Castle Butte
Pyramid Peak
Franklin Butte
Balanced Rock
Valley of the Gods
Rooster Butte
Setting Hen Butte
JEEP TRAIL
Ridge
Snake Canyon
Gaging Sta
T. 39 S.
T. 40 S.
R. 19 E.
R. 20 E.
36
31
1
6

cation and closed to new mineral leasing and sale. Although no mining claims now exist, development work, extraction, and patenting would be allowed to continue on any valid mining claims that may be located prior to wilderness designation. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809) with consideration given to wilderness values. Existing oil and gas leases involving 50,870 acres would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown. No new oil and gas leasing would be allowed.

- Present domestic livestock grazing would continue as authorized in the South San Juan MFP. The 1,450 AUMs in the WSA would remain available to livestock as presently allotted. The use and maintenance of range developments existing at the time of designation (6 miles of fence, two stock trails, 13 reservoirs, and one corral) could continue in the same manner as in the past based on practical necessity and reasonableness. After designation, new developments would be allowed on a case-by-case basis if necessary for range and/or wilderness resource protection and management, and if consistent with wilderness protection standards (refer to Appendix 1). The .50 mile of fence currently proposed would probably be allowed under this alternative. The proposed 1,800-acre vegetation treatment would probably not be allowed.
- New water resource facilities or watershed activities (not related to range or wildlife management) would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments, other than those listed for livestock, are located in the Road Canyon WSA, and none are planned.
- Wildlife transplants or habitat developments would be allowed after designation if compatible with wilderness values. However, none are planned in the WSA.
- The entire 52,420-acre WSA would be closed to ORV use except for: (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) for occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. The approximately 7 miles of existing vehicular way in the WSA would not be available for vehicular use except as indicated above. Approximately 10 miles of "cherry-stemmed" roads in the WSA would remain open to vehicular traffic. Three State sections would also be "cherry-stemmed" in association with these roads. About 14 miles of the WSA boundary follow existing unpaved roads and jeep trails that would also remain open to vehicular travel.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 52,420-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads that are adjacent to or "cherry-stemmed" into the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is minimal harvest of forest products at the present time.
- Visual resources in the WSA would be managed in accordance with VRM Class I standards which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to aerial and hand methods.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resource. Research

and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.

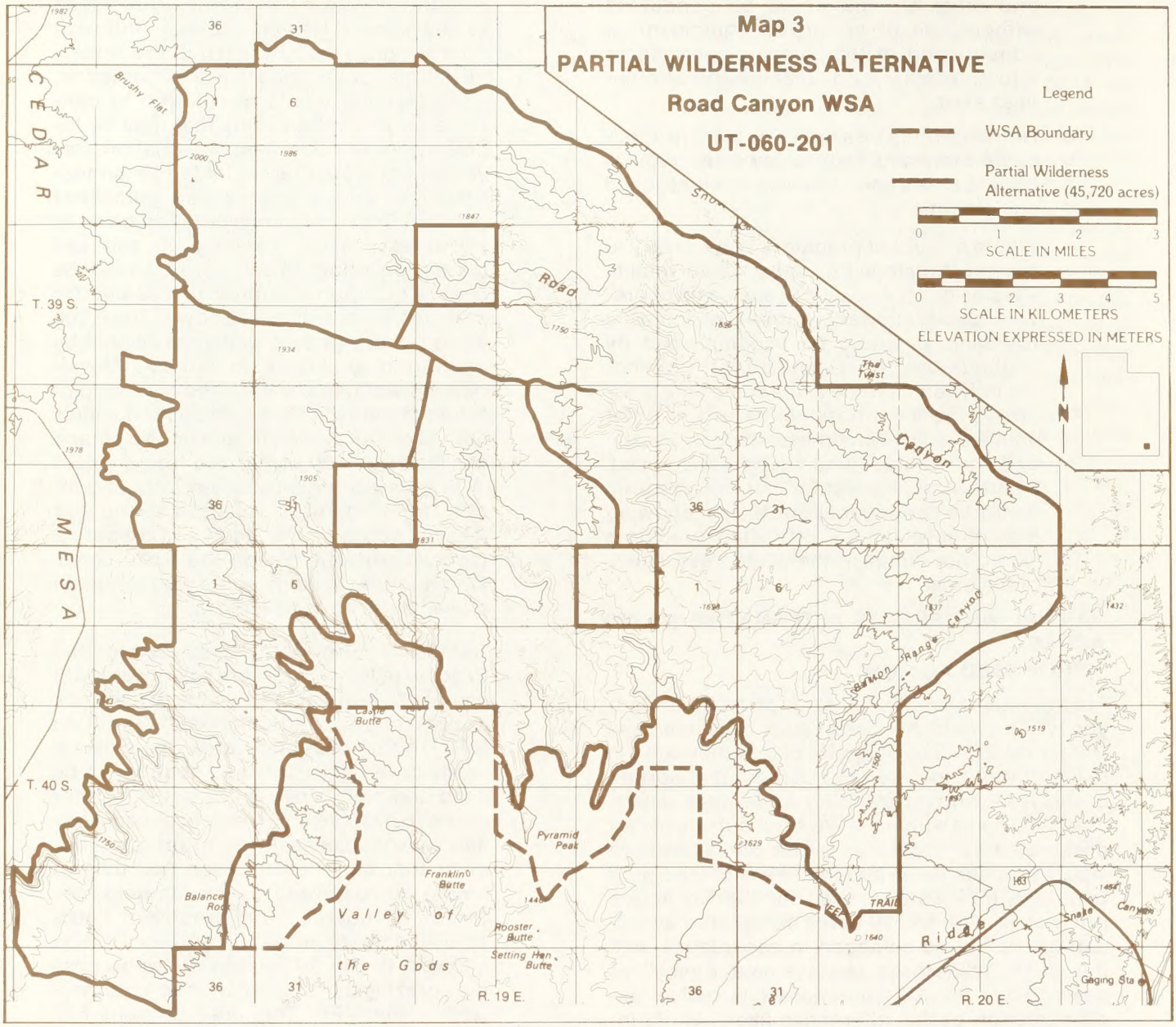
- Hunting would be allowed subject to applicable State and Federal laws and regulations but without the use of motorized equipment.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

PARTIAL WILDERNESS ALTERNATIVE (45,720 ACRES) (PROPOSED ACTION)

For this alternative, 45,720 acres of the Road Canyon WSA would be designated as wilderness (refer to Map 3). The objective of this alternative is to identify and analyze as wilderness that portion of the WSA with outstanding wilderness values. The 6,700 acres within the WSA but outside of that designated as wilderness under this alternative would be managed in accordance with the South San Juan MFP as described for the No Action Alternative. The 45,720 acres designated as wilderness would be managed in accordance with the BLM "Wilderness Management Policy" as described in the All Wilderness Alternative. Implementation of this alternative likely would involve Federal acquisition of three sections of State land (1,920 acres) (refer to Appendix 3). Four of twelve State section adjacent to the wilderness area likely would not be exchanged. Assumptions regarding analysis and impacts for State lands involved in this Partial Wilderness Alternative are the same as described for the All Wilderness Alternative. The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located in the wilderness area.

A summary of specific actions under this alternative follows.

- The 45,720-acre wilderness area would be withdrawn from mineral entry and closed to new mineral leasing and sale. Although no mining claims now exist in the wilderness area, development work, extraction, and patenting would be allowed to continue on any valid claims that may be located prior to wilderness designation. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809) with consideration given to wilderness values. Existing oil and gas leases, covering 44,340 acres, would be phased out upon expiration unless a find in commercial quantities is shown. The 6,700 acres not designated wilderness would be open to mineral location and sale. Development work, extraction, and patenting of future mining claims could occur if claims are valid. Development of existing oil and gas leases (6,530 acres) and future leases in this area could be allowed without concern for wilderness values. Oil and gas leasing would be managed as Category 2 (special stipulations) on the 6,530 acres. One hundred seventy acres would remain closed to oil and gas leasing.
- Domestic livestock grazing would continue to occur in the 45,720-acre wilderness with 950 AUMs remaining available to livestock as presently allotted in the South San Juan MFP. In the wilderness area, the existing range developments would continue to be used and maintained in the same manner as in the past based on practical necessity and reasonableness. Any future development that may be proposed (.50 mile of fence) would have to meet wilderness protection standards. The proposed 1,800-acre land treatment would probably not be allowed. In the 6,700-acre nonwilderness area grazing use would continue as authorized in the MFP. This area contains 500 AUMs. Existing developments could be used and maintained and new range developments could be developed without concern for wilderness values.
- New water resource facilities or watershed activities not related to range or wildlife management would be allowed in the 45,720-acre wilderness area only if enhancing to wilderness values, if necessary to correct conditions that are imminently hazardous to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act*. In the remaining 6,700-acre nonwilderness area,


Map 3
PARTIAL WILDERNESS ALTERNATIVE
Road Canyon WSA
UT-060-201
Legend
WSA Boundary
Partial Wilderness Alternative (45,720 acres)
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
CEDAR MESA
Brushy Flat
Road
The West
Canyon
Harmon Canyon
Range
Castle Butte
Pyramid Peak
Franklin Butte
Balance Rock
Valley of the Gods
Rooster Butte
Setting Hen Butte
TRAIL
Ridge
Snake Canyon
Gaging Sta
T. 39 S.
T. 40 S.
R. 19 E.
R. 20 E.
36
31
6
1

water resource developments would be allowed if in accordance with the MFP. None are currently planned.

- In the wilderness area, wildlife transplants or habitat improvements would be allowed only if compatible with wilderness values. In the nonwilderness area wildlife transplants or improvements would be allowed with no concern for wilderness values.
- The wilderness area would be closed to ORV use. About 7 miles of existing way would not be available for vehicular use except in situations described in the All Wilderness Alternative. Approximately 10 miles of "cherry-stemmed" roads would continue to be available to vehicular travel. Three State sections connected by the roads would also be "cherry-stemmed." The remaining acres in the unit, including the existing roads that border the WSA, would remain open to vehicular travel.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 45,720-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products in the wilderness area would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. The remaining area would be open to woodland harvest.
- Visual resources in the wilderness area would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change. The area not designated wilderness would be managed as VRM Class II (1,600 acres) and VRM Class III (5,100 acres).
- Within the wilderness, measures to control fire, insects, noxious weeds, or disease would be taken only in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least impact to wilderness values. Therefore, it is assumed that firefighting would be limited to hand and aerial methods. In the portion of the unit not designated, measures of control could be taken without consideration of wilderness values.
- Gathering information about natural resources would be allowed by permit in the entire WSA. However, in the wilderness area such activity would be limited to that conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- In the entire WSA hunting would be allowed subject to applicable State and Federal laws and regulations. Use would be limited to nonmotorized means in the wilderness area.
- Throughout the entire WSA, control of predators would be allowed to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. In the wilderness area, however, predator control would only be allowed under conditions that would ensure minimal disturbance to wilderness values. In the wilderness portion, poison baits or cyanide guns would not be allowed.

PARTIAL WILDERNESS ALTERNATIVE (23,220 ACRES)

For this alternative, 23,220 acres of the Road Canyon WSA would be designated as wilderness (refer to Map 4). The objective of this alternative is to identify and analyze the most outstanding portion of the WSA, which consists of the northern one-third of the WSA. The 29,200-acre area within the WSA, but outside of that designated as wilderness, would be managed in accordance with the South San Juan MFP as described for the No Action Alternative. The area designated as wilderness would be managed in accordance with the BLM "Wilderness Management Policy" as described in the All Wilderness Alternative.

Upon designation, acquisition of one section (640 acres) of State land would be likely. Three of ten State sections adjacent to the wilderness area likely would be exchanged. Assumptions regarding analysis and impacts for State lands are the same as described for the All Wilderness Alternative. The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located in the wilderness area.

Map 4
PARTIAL WILDERNESS ALTERNATIVE
Road Canyon WSA
UT-060-201
Legend
WSA Boundary
Partial Wilderness Alternative (23,220 acres)
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
CEDAR MESA
Bushy Flat
Road Canyon
The Twist
Salmon Range
Castle Butte
Pyramid Peak
Franklin Butte
Balanced Rock
Valley of the Gods
Rooster Butte
Setting Hen Butte
Snake Canyon
Geging Sta
T. 39 S.
T. 40 S.
R. 19 E.
R. 20 E.
36
31
6
1

A summary of specific actions for this alternative follows:

- The 23,220-acre wilderness would be withdrawn from mineral entry and closed to new mineral leasing and sale. Although no mining claims now exist in the wilderness area, development work, extraction, and patenting would be allowed on any valid claims that may be located prior to wilderness designation. Development would be regulated by unnecessary or undue degradation regulations (43 CFR 3809) with consideration given to wilderness values. The existing oil and gas leases, covering 21,895 acres, would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown. The 29,200 acres not designated wilderness would be open to mineral location and sale. Development work, extraction, and patenting of future mining claims could occur in the area if claims are valid. Development of existing oil and gas leases (28,975 acres) and future leases could occur without concern for wilderness values. The area not designated would be managed as oil and gas leasing Category 2 (special stipulations) on 28,585 acres and Category 3 (no surface occupancy) on 390 acres. Two hundred twenty-five acres would remain in Category 4 (no leasing).
- Domestic livestock grazing would continue to occur in the 23,200-acre wilderness area. The 736 AUMs in the designated area would remain available to livestock as presently allotted. The use and maintenance of range developments located in the wilderness area could continue in the same manner as in the past, based on practical necessity and reasonableness. After designation, new developments would be allowed on a case-by-case basis if necessary for range and/or wilderness resource protection and management, and if consistent with wilderness protection standards. No developments are proposed in the designated area. Eight hundred acres of the proposed 1,800-acre land treatment are located in the wilderness area and would not be allowed. In the 29,200-acre nonwilderness area grazing use would continue as authorized in the MFP (714 AUMs). New range developments, including 1,000 acres of land treatment, could be developed there without concern for wilderness values.
- New water resource facilities or watershed activities would be allowed in the wilderness area only under the conditions described in the All Wilderness Alternative. In the nonwilderness area water resource developments would be allowed if in accordance with the MFP. None are now planned.
- In the wilderness area, wildlife transplants or habitat improvements would be allowed if they are compatible with wilderness values. No transplants or improvements are planned. In the nonwilderness area, wildlife transplants or improvements would be allowed without wilderness considerations.
- No "cherry-stemmed" roads or State sections would be involved. The wilderness area would be closed to ORV use. The remainder of the unit would remain open to ORV use. Vehicular use of approximately 7 miles of existing way could occur and development and use of new road access would be allowed in this nondesignated portion.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 23,220-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads that are adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products in the wilderness area would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. The remaining acres would be open to woodland harvest.
- Visual resources in the wilderness area would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change. The remaining acres would be managed as VRM Class II (13,930 acres), Class III (12,980 acres), and Class IV (2,290 acres).
- Measures to control fire, insects, noxious weeds, or disease would be allowed in the entire WSA. However, within the wilderness area such action would be taken only in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unac-

ceptable change to the wilderness resource would result if measures were not taken. It is assumed that fires would be controlled only by hand or aerial methods in the designated wilderness area.

- In the entire WSA any activity for the purpose of gathering information about natural resources would be allowed by permit. In the wilderness area such activity would be limited to that conducted without use of motorized equipment or construction of temporary or permanent structures.
- Hunting would be allowed in the entire WSA subject to applicable State and Federal laws and regulations. In the wilderness area, the use would be limited to nonmotorized means.
- Throughout the entire WSA control of predators would be allowed to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. In the wilderness area, poison baits or cyanide guns would not be allowed.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences that would result from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of impacts.

AFFECTED ENVIRONMENT

Air Quality

The WSA has a Class II air quality classification in accordance with the Prevention of Significant Deterioration (PSD) regulations (Environmental Protection Agency, 1979). The WSA is within the Four Corners Interstate Air Quality Control Region, which includes several coal-fired powerplants. However, none of the powerplants are within 80 miles of Road Canyon, and the air quality is very good. The nearest Class I air quality area is Canyonlands National Park some 40 air miles north of the WSA. Visual range in the general vicinity averages between 100 and 132 miles during the summer (Aerocomp, Inc., 1984).

Geology

Road Canyon WSA lies entirely within the Canyonlands Section of the Colorado Plateau Physiographic Province. The topography of the WSA varies widely from north to south. The northern portion of the WSA is a gently rolling to flat-lying plateau dissected by more than 25 miles of drainages associated with Road Canyon and Lime Creek. In the southern portion of the WSA the uplifted plateau ends abruptly and the drainages empty into broad alluvial desert valleys. The elevation ranges from 6,500 feet on the northern plateau to 4,700 feet in the southern valley bottoms.

The upper canyons within the WSA are generally steep-sided, narrow (less than 30 feet in places), and sinuous, with walls of alternating layers of sheer sandstone cliffs and rocky talus slopes. The upper canyons open up into canyons that are several hundred feet wide, but are also steep-sided and 600 to 800 feet deep in places. To the south, the canyons give way to broad desert valleys with isolated monoliths and rock fingers left as the only remnants of former canyon walls.

The WSA lies along the broad eastern limb of the Monument Upwarp, a major north-trending structural division of the Colorado Plateau. Surface geology over the northern two-thirds of the tract consists of flat-lying beds of the Cedar Mesa Sandstone Member of the Cutler Formation of the Permian Age. In the southern part of the tract, erosion has stripped away the Cedar Mesa Sandstone and has exposed the Halgaito Tongue of the Cutler Formation and the underlying Elephant Canyon Formation of Pennsylvanian and Permian Age. Topographical features include the north-trending Comb monocline along the east side of the tract and several broad anticlines and synclines within the tract. The Comb Ridge monocline is a major structural feature of the Colorado Plateau along which the eastern side of the Monument Upwarp has been folded.

Soils

Soil characteristics and land types are given in Table 2. The majority of the WSA consists of shallow, well drained soils and exposures of rock outcrop. Shallow to very deep soils occupy the canyons and valley floors. Shallow, well drained, loamy Moenkopi soils are on the sandstone and shale pediments. These soils range from fine sandy loams to sandy clay loams and are moderately susceptible to water erosion.

Washes cutting through this unit have deep and

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
ROAD CANYON WSA

Resource	Alternatives			
	No Action	All Wilderness (52,420 Acres)	Partial Wilderness Designation (45,720 Acres) (Proposed Action)	Partial Wilderness Designation (23,220 Acres)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil and 18 billion cubic feet of natural gas.	Oil and gas likely would not be recovered. Due to the low likelihood of recovery, however, the loss of development opportunity would not be significant.	Although likelihood is low, up to 0.5 million barrels of oil and 2.7 billion cubic feet of natural gas could be recovered.	Although likelihood is low, up to 1.7 million barrels of oil and 10 billion cubic feet of natural gas could be recovered.
Wildlife	About 0.3 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat. Wildlife would benefit from land treatment on 3.4 percent of the WSA.	Wildlife would benefit from solitude, but the proposed land treatment for grazing, which would benefit wildlife, would not be allowed.	Wildlife in the designated area would benefit from solitude. About 0.3 percent of the nondesignated portion could be disturbed by mineral and energy development, which could adversely affect wildlife habitat. The proposed land treatment for grazing would not be allowed.	Wildlife would benefit from solitude in the designated area and from 1,000 acres of land treatment in the nondesignated portion (3.4 percent of the nondesignated area). Adverse effects on wildlife habitat could result from disturbance of about 0.3 percent of the nondesignated portion by mineral and energy development.
Livestock	Grazing of 1,450 AUMs and maintenance of existing developments would continue. Proposed new developments, consisting of 0.5 mile of fence and 1,800 acres of land treatment, could be implemented. Land treatment could provide up to 430 more AUMs of forage.	Grazing of 1,450 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. Proposed new developments might not be allowed. Potential for 430 additional AUMs would be foregone.	Effects would be about the same as for the All Wilderness Alternative.	Effects would be about the same as for the All Wilderness Alternative. One thousand acres of land treatment would be allowed in the nondesignated portion, which could produce 240 AUMs.
Visual Resources	The quality of visual resources could be impaired on up to 1,960 acres.	Visual quality would not be impaired, as mineral-related developments and land treatments would not occur.	Visual quality could be impaired on up to 20 acres (only the nondesignated portion would be affected). All of the Class A scenery would be within the designated portion and would be protected by the reduced potential for disturbance.	Visual quality could be impaired on up to 1,090 acres (only the nondesignated portion would be affected). About 37 percent of the Class A scenery would be in the designated portion and would be protected by the reduced potential for disturbance.

TABLE 1 (CONTINUED)
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
ROAD CANYON WSA

Resource	Alternatives			
	No Action	All Wilderness (52,420 Acres)	Partial Wilderness Designation (45,720 Acres) (Proposed Action)	Partial Wilderness Designation (23,220 Acres)
Recreation	ORV use would continue. Overall recreational use could increase from the present 300 visitor days per year to 450 over the next 20 years. Up to 160 acres of mineral-related disturbance and 1,800 acres of land treatment could reduce the quality of primitive recreation.	The WSA, including 7 miles of ways, would be closed to ORV use. Primitive recreational use could increase by an undetermined amount, but estimated at up to 10,484 visitor days per year in the next 20 years, due to publicity associated with wilderness designation.	ORV recreational use could continue in the nondesignated portion. Overall recreational use might increase to 9,144 visitor days in the next 20 years.	ORV recreational use could continue on 7 miles of ways in the undesignated portion. Overall recreational use might increase to 4,644 visitor days in the next 20 years.
Wilderness Values	Wilderness values could be lost on up to 1,960 acres (3.7 percent of the WSA).	Wilderness values would be protected, as mineral-related disturbance and land treatments would not occur.	Wilderness values would be protected in the designated area. Impairment could be expected on 0.3 percent of the 6,700 acres not designated (or 0.04 percent of the entire WSA). However, 87 percent of the area meeting the standards for naturalness and all of the areas meeting the standards for outstanding opportunities for solitude and primitive recreation would be in the designated portion and would be protected by reduced potential for disturbance.	Wilderness values would be protected in the designated area. Impairment could be expected on 3.7 percent of the 29,200 acres not designated (or 2 percent of the entire WSA). However, 44 percent of the area meeting the standards for naturalness, 51 percent of the area meeting the standards for outstanding opportunities for solitude, and all of the area meeting the standards for outstanding opportunities for primitive recreation would be in the designated portion and would be protected by reduced potential for disturbance.
Land Use Plans and Controls	This alternative would be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the current BLM South San Juan MFP.	This alternative would not be consistent with San Juan County's concept of multiple use. It would be consistent with State policy if lands were exchanged. Designation would constitute amendment of the BLM South San Juan MFP or the forthcoming San Juan RMP.	Partial designation would be the same as the All Wilderness Alternative, except that the portion not designated would be consistent with San Juan County's concept of multiple use.	Consistency would be about the same as with the 45,720-acre Partial Wilderness Alternative, but a larger portion of the WSA would be consistent with existing land use plans.

TABLE 1 (CONTINUED)
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
ROAD CANYON WSA

Resource	Alternatives			
	No Action	All Wilderness (52,420 Acres)	Partial Wilderness Designation (45,720 Acres) (Proposed Action)	Partial Wilderness Designation (23,220 Acres)
Socio-economics	Annual local sales of less than $30,230 and Federal revenues of up to $154,840 would continue. Increased AUMs from the proposed land treatment could provide up to $8,600 in livestock sales.	Annual local sales of less than $30,230 and Federal revenues of up to $2,030 would continue, but Federal revenues of up to $152,610 would be foregone. Increased recreational use over the next 20 years might provide up to $42,984 in local benefits. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.	The effects of this alternative would be the same as for the All Wilderness Alternative, except that annual Federal revenues would be reduced by up to $133,020. Increased recreational use might provide an additional $37,490 in local benefits.	The effects of this alternative would be about the same as for the All Wilderness Alternative, except that annual Federal revenues would be reduced by up to $65,685. Increased recreational use might provide an additional $19,040 in local benefits.

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Bare Soil Surface
Rock Outcrop	10	5,242	0.0	0
Shallow loamy soils on sloping structural benches and ledges	45	23,600	1.0	5
Deep loamy soils on gently sloping structural benches	25	13,105	0.1	5
Deep stony soils on steep canyonsides	20	10,473	1.0	10
Totals	100	52,420		

Source: Hansen, 1985.

very deep sandy and loamy soils. There are also areas of deep and very deep sandy soils in sand drifts where eolian material has accumulated. There is dry farming near the northwest corner of the WSA, and it appears that some of the areas with deeper soils in the WSA could have potential for agricultural development. No plans exist for agricultural development in the area.

The face of the escarpment of Cedar Mesa consists of shallow to very deep gravelly and very stony soils on steep fans. On the intermediate benches of Cedar Mesa, near Road Canyon, are a complex of shallow to very deep soils and rock outcrops (slickrock).

Table 3 summarizes soil erosion conditions for the WSA.

Vegetation

The vegetation of the WSA can be classified as either sagebrush, pinyon-juniper, desert shrub, or barren, as shown in Table 4.

The sagebrush type includes understory species such as curlygrass, bottlebrush, squirreltail, Indian ricegrass and fourwing saltbush.

The desert shrub community includes blackbrush, along with two other primary species: fourwing saltbush and Mormon tea. Understory species include curlygrass, Indian ricegrass, and other grass species. Pinyon-juniper communities contain understory species of sagebrush, squirreltail, and forbs. The barren areas are basically bare rock or soil and drainages with a very low density of plants. There is no riparian vegetation identified in the WSA.

No known threatened or endangered plant species are located within the WSA. Two sensitive plant species (*Astragalus cronquistii* and *Eriogonum clavellatum*) which may occur in the WSA are currently being reviewed by the Fish and Wild-

TABLE 3
Erosion Condition

Erosion Class	Erosion Rate (Cubic yards/acre/year	Annual Soil Loss Under Present Conditions: Percent of Area	Acres	Cubic Yards	Annual Soil Loss if Disturbed: Percent of Area	Acres	Cubic Yards
Very High	20.0	-			-		
High	10.0	-			20	10,484	104,840
Medium	5.0	-			45	23,589	117,945
Low	1.0	65	34,073	34,073	25	13,105	13,105
Very Low	0.1	25	13,105	1,310	-	-	-
None	0.0	10	5,242		10	5,242	-
Totals		100	52,420	[1]35,383	100	52,420	[1]235,890

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.67 under present conditions; 4.5 if disturbed.

life Service (FWS) for possible listing as threatened or endangered.

The Road Canyon WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) types of the WSA are listed in Table 5. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Sagebrush	1,924	4
Desert shrub	21,973	42
Pinyon-juniper	15,285	29
Barren	13,238	25
Totals	52,420	100

Source: USDI, BLM, 1971a.

TABLE 5
Potential Natural Vegetation Types

PNV Type	Acres	Percent of WSA
Juniper-pinyon woodland	36,000	69
Blackbrush	16,420	31
Totals	52,420	100

Source: USDI, Geological Survey, 1978.

Water Resources

Water is a somewhat limited resource throughout much of the WSA. There are no perennial streams. The water sources consist of 13 livestock reservoirs and four springs (undeveloped). Pools of water are left in the canyons after spring runoff. Water quality generally is good.

Mineral and Energy Resources

The BLM, in consultation with the U.S. Department of Energy, had each WSA within Utah independently assessed for its energy and mineral resources by Science Applications, Inc. (SAI, 1982). Refer to Appendix 5 for a detailed description of the SAI rating system.

An overall importance rating (OIR) of 2 was assigned to the Road Canyon WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA. The energy and mineral resource rating is given in Table 6.

TABLE 6
Mineral and Energy Resource Rating Summary

	Rating		
Resource	Favorability[1]	Certainty[2]	Estimated Resource
Oil and Gas	f2	c2	Less than 10 million barrels of oil; less than 60 billion cubic ft. of gas
Uranium/ Vanadium	f1	c1	None
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydroelectric	f1	c4	None
Copper	f1	c1	None
Manganese	f1	c1	None
Potash	f1	c3	None

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by FLPMA. BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need (Federal

Emergency Management Agency, 1983). There are no minerals currently listed as strategic and critical found within the Road Canyon WSA.

LEASABLE MINERALS

Geologically, the WSA is similar to the area of the nearby Aneth and Bug oil and gas fields. Therefore, it seems reasonable to assume that there is potential for oil and gas within the WSA. However, broad uplifts over the centuries have significantly lowered the area's oil and gas potential. The uplifts caused erosion that stripped overlying sedimentary rocks, allowing the oil to drain away. Therefore, if oil and gas accumulations exist, they are likely associated with stratigraphic traps and small-scale folding. The favorability for oil and gas in the WSA is considered to be low with an estimated resource of less than 10 million barrels of oil and less than 60 billion cubic feet of gas. The estimated recoverable resource is less than 3 million barrels of oil and less than 18 billion cubic feet of gas.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

There are 38 pre-FLPMA oil and gas leases (43,550 acres) and 26 post-FLPMA leases (7,320 acres) within the WSA. All leases on public land within the WSA are either leased with special stipulations (for protection of aesthetic, watershed, and cultural values) or no surface occupancy. Oil and gas leasing categories were established for the WSA in 1975. These are summarized in Table 7.

TABLE 7
Oil and Gas Leasing Categories

	Category	Acres of WSA	Percent of WSA
1	Open, standard stipulations	0	0
2	Open, standard and special stipulations	44,450	85
3	Open, no surface occupancy	6,420	12
4	Closed to leasing	1,550	3
	Total	52,420	100

Source: USDI, BLM, 1975.

There has been limited exploration activity in the WSA. A well was drilled in the WSA (Township 39 South, Range 19 East, Section 19), but apparently it was a dry hole and subsequently was abandoned. There is 1 linear mile of past seismic testing in the WSA. In 1984 there was a proposal to drill on a State section within the WSA but, as of March 1985, the well was not drilled. Currently, there is some exploration drilling being done in the general vicinity of the area outside the WSA.

Due to unfavorable geologic conditions, it has been determined that no coal, potash, geothermal, or other leasable resources are present in this WSA. No leases exist for these resources.

LOCATABLE MINERALS

The principal uranium, copper, and manganese bearing units on the Colorado Plateau, the Morrison Formation of Jurassic Age and the Chinle Formation of Triassic Age, have been removed from the WSA by erosion. Of the formations that are preserved in the WSA, only the Cutler Formation has been productive for uranium elsewhere in the Moab District (at Lisbon Valley). The Cutler Formation, however, is not considered favorable for uranium or vanadium because it contains no known uranium anomalies in this area, as well as very little organic carbon and mudstone. Due to geologic unfavorability it is expected that the WSA does not contain commercial quantities of manganese, copper, or uranium.

Other locatable minerals such as lead, zinc, and silver are essentially absent from the sedimentary units of the Colorado Plateau except in areas of igneous intrusion.

There are no mining claims recorded in the WSA.

SALABLE MINERALS

The salable minerals within the WSA have little or no commercial potential. The poor quality of the materials available and the remote nature of the deposits render them of limited value as a resource.

Wildlife

Mammals common to the Road Canyon WSA include spotted skunk, ringtail cat, mountain lion, bobcat, coyote, cottontail rabbit, whitetail antelope squirrel, Ord kangaroo rat, pinyon mice, whitethroat woodrat, and assorted bats. A few resident mule deer utilize the area during the winter. The WSA is in Deer Herd Unit 31B and has been closed to hunting since the 1980 season. However, the area did receive limited use prior to the hunting closure.

Birds common to the area include hairy woodpecker, violet-green swallow, pinyon jay, titmice, rock wren, red-tailed hawk, American kestrel, and great horned owl. The mourning dove, a gamebird, nests in the area and the chukar (an exotic) may occasionally be found along the eastern edge of the WSA. There is very little waterfowl habitat in the area.

Reptiles and amphibians common to the area include the Great Basin spadefoot toad, red-spotted toad, sideblotched lizard, northern plateau lizard, orange-headed spiny lizard, Great Basin gopher snake, and Hopi rattlesnake.

The Road Canyon WSA is within the White Canyon-Red Canyon Desert Bighorn Sheep Habitat Management Area; however, there have been no sightings of bighorn sheep since 1978. Evidence indicates this area to be historical habitat. It is not expected that bighorn sheep will reestablish a population in the WSA and no habitat improvements or bighorn sheep transplants are planned.

The FWS has not identified any threatened or endangered species within the WSA. However, bald eagles (an endangered species) are winter transients in the area even though roosting sites have not been located.

There are no acres of crucial or Federally designated critical habitat in the WSA. There are no existing or planned wildlife management facilities in the WSA.

Forest Resources

There are 15,285 acres of pinyon-juniper woodland within the Road Canyon WSA. These are low quality sites (less than 20 cubic feet usable wood per acre) and are considered nonproductive forest land (USDI, BLM, 1971a). At the present time, pulp and papermaking opportunities are low. No areas near the WSA have been designated as Christmas tree cutting areas. Less than an estimated 2,390 cords of fuelwood occur in the WSA.

During 1981, 26 permits were sold to cut 1,700 juniper posts in the Cedar Mesa area; however, very few, if any, of these posts were cut in the WSA. Also, in 1981, there were 323 free-use firewood permits issued in the San Juan Resource Area, which includes nearly all of San Juan County. In the vicinity of Road Canyon WSA, wood is gathered along the roads to Snow Flat and Cigarette Point, but quantities are unknown. Some firewood harvesting is done by individuals coming from the south.

Pine nuts are gathered by a few individuals, but there have been no commercial gathering permits issued for this WSA.

Livestock and Wild Horses/Burros

Much of the Road Canyon WSA has low forage production because of the extent of shallow soils and the invasion of pinyon and juniper on deep soils of Cedar Mesa.

The WSA contains portions of four different allotments and a total of 1,450 AUMs of livestock forage. Grazing information for each allotment is shown in Table 8.

There are 13 reservoirs, 6 miles of fence, one corral, and two stock trails within the WSA. Additional livestock developments proposed include 1,800 acres of vegetation treatment (chaining and seeding) and one fence (.5 mile). The vegetation treatment would provide an additional 430 AUMs of forage in the Perkins Brothers Allotment.

The existing vehicular way (7 miles) has been closed and rehabilitated. It is not currently used by livestock operators or BLM.

There are no wild horses or burros within the WSA.

Visual Resources

The WSA can be characterized in the following three major landforms.

The Grand Gulch Plateau, which occupies the northwest portion of the WSA with its southeast aspect, is gently rolling to relatively flat topography with isolated horizontal bands of exposed

TABLE 8
Livestock Grazing Use Data

Allotment	Class of Livestock	Number of Operators	Season of Use	Total AUMs in Allotment	AUMs in WSA	Percent of AUMs in WSA
Slickhorn	219 cattle 5 horses	1	10/16 to 6/15	1,795	19	1
Texas-Muley	274 cattle	1	11/15 to 5/31	1,795	157	9
Perkins Brothers	1,082 cattle 38 horses	4	11/01 to 5/31	7,579	565	7
Comb Wash	528 cattle	13	10/06 to 5/31	3,961	709	18
Totals		19			1,450	

Source: USDI, BLM, 1971a.

sandstone. The plateau is dissected by the canyon drainage of Road Canyon and Lime Creek. The soil colors range from light pink to red, and the exposed sandstone colors range from medium red to light gray. The colors of the vegetation range from dark to medium green to gray-green. Textures of the soils and sandstone are fine and smooth, while the textures of the vegetation vary from coarse to fine.

Road Canyon and Lime Creek are similar canyons which drain southeast. Flat bottoms, lower talus slopes, and steep upper slopes of exposed sandstone in horizontal bands characterize these canyons. Light gray and pink colors in these bands contrast sharply with vertical streaks of desert varnish. Textures vary from smooth to fine to coarse. The canyons in the WSA are the most scenic parts of the entire Lime Creek drainage. The vegetation ranges from riparian-associated cottonwood/willow/tamarisk in the canyon bottoms to scattered pinyon-juniper on the slopes.

The Valley of the Gods located along the southern boundary is relatively flat, but within the WSA gradually rises to the escarpment of the Grand Gulch Plateau and then rises abruptly 700 feet to the mesa top. The soil color is a light pink with a fine texture. The vegetation consists of sparse desert shrubs which range from light to dark green and gray-greens with fine textures.

The WSA contains three scenic classes: Class A (high quality) scenery comprises 56 percent (29,355 acres) of the WSA and is located in Road and Barton Canyons and Lime Creek Canyon. Class B scenery comprises 28 percent (14,680 acres) of the WSA and is located on the tablelands between the two forks of both Lime Creek and Road Canyon. Class C scenery comprises 16 percent (8,385 acres) of the WSA and is located along the southern and eastern boundaries.

The WSA contains three VRM classes: Class II comprises 55 percent (28,830 acres) of the WSA and is located in Road, Barton, Lime Creek, and the West Fork of Lime Creek Canyons. Class III comprises 37 percent (19,400 acres) of the area and is located on the mesa tops above Road Canyon and along the southern boundary. Class IV comprises 8 percent (4,190 acres) of the area and is located on the mesa top between Lime Creek and the West Fork of Lime Creek. Refer to Appendix 7 for a description of BLM's VRM rating system.

Cultural Resources

The Road Canyon WSA contains a wealth of pristine cultural resources. The most comprehensive cultural resources inventory work thus far conducted in the Road Canyon area was completed during the summer of 1977 (Lipe and Madson, 1977). Sixty-five sites have been recorded. The amount of site information from this area is a reflection of the amount of inventory done. Where inventories have been performed, sites have been found.

The 65 recorded sites represent a fairly even distribution between Basketmaker and Pueblo cultural manifestations. Most of the Basketmaker sites consist of camps, scatters or storage cists,

while the majority of Pueblo sites are either open habitation camps or cliff dwellings, which include habitation and/or storage structures (granaries).

The Hole-in-the-Rock Trail, a National Register site, forms the WSA's northeast boundary. There are no existing National Register sites or nominations in the WSA. However, based on estimates from similar settings in the area, it could be expected that 6,142 sites would be located in the WSA, of which 4,095 would be National Register eligible. Occasional vandalism of cultural resource sites is a problem in this vicinity.

Of special historic interest is Cigarette Spring Cave which was surveyed in 1908 and withdrawn from land entry because, at that time, it was the only water source available for public use for intermediate stops on the way to Natural Bridges National Monument.

Recreation

The extensive canyon and plateau systems offer excellent opportunities for desert hiking, backpacking, horseback riding, and photography. The Road Canyon WSA is not a heavily used recreational area. Very few people are aware of the recreational opportunities in Road and Lime Canyons. In 1982, less than 100 noncommercial visitor use days were recorded. This WSA has one commercial user: the National Outdoor Leadership School. Since 1972, this school has used an average of 180 commercial user days per year in this area, with the exception of 1980 when 640 days were recorded.

Therefore, the total recreational use of the WSA is currently estimated to average about 300 visitor days annually. Nearly all of the use is attributed to primitive activities; however, to enter the area, some recreationists utilize vehicular access on the 10 miles of "cherry-stemmed" road. This road leads to many scenic overlook areas. The WSA is generally open to ORV use, although the 7 miles of vehicular way have been rehabilitated.

There are no established campsites in this area, although open areas by canyon rims are a popular choice. Since there are no marked trails in the canyons, hikers must be capable of reading a topographic map and be good at route-finding. This is especially important if hikers are in the West Fork of Lime Creek, or going cross country between Road and Lime Canyons. The presence of many small side canyons can be quite confusing. Usually, the easiest foot access is near the head or mouth of either canyon, where the walls are shallow.

The WSA did receive a limited amount of deer hunting activity prior to being closed to hunting in 1980. In the past it was not a heavily used area. The WSA is part of the Utah Division of Wildlife Resources (UDWR) Deer Herd Unit 31B.

Wilderness Values

SIZE

The size of the WSA (52,420 acres) is sufficient to meet the size standard for areas under wilderness review. The WSA is approximately 9 miles long from north to south and 10 miles wide from east to west at the widest point.

NATURALNESS

Several minor imprints of human activities are found adjacent to the boundaries in the WSA. With the exception of a corral and two stock trails, the imprints are pre-FLPMA and are associated with energy exploration and grazing activities.

Thirteen livestock reservoirs are within, but near the boundaries of the WSA. The majority of the reservoirs are greater than 20 years old and have substantially revegetated. The earth dams creating these reservoirs generally do not exceed 6 feet in berm and 30 feet in length, and disturb less than .25 acre. A post-FLPMA post-and-log corral was constructed in December 1976 adjacent to the Cigarette Springs boundary road, affecting .25 acre. A total of approximately 6 miles of fencing is found at various points along the perimeter of the WSA. A 7-mile way was bladed on a plateau between Lime Creek and the West Fork of Lime Creek. The way was revegetated throughout most of the plateau, making it substantially unnoticeable. Seismic lines follow the Cigarette Springs boundary road and extend 1 mile into the area from Brushy Flat. The lines have a localized effect due to dense pinyon screening. An abandoned drill hole lies just north of Snow Flat adjacent to the northern boundary. The disturbed area covers .25 acre and has substantially revegetated.

All of the human imprints in this area are of minor impact. Most intrusions are near boundaries. Imprints affect less than 1 percent of the WSA. The entire 52,420 acres meet the naturalness standard for areas under wilderness review.

SOLITUDE

Opportunities for solitude are outstanding in most of the area. The rolling plateaus and deep winding canyons provide excellent topographic screening from other users, enhancing the feeling of seclusion. The plateaus and canyons are effectively screened by dense pinyon-juniper and ri-

parian vegetation. Vistas from cliffs along the plateaus reveal a substantially natural area which provides exceptional solitude due to the vastness of the viewshed. The southern boundary road can be viewed from the edge of plateaus or open areas on high points, but the distance from the road seems great enough to maintain a feeling of solitude.

From viewpoints within the southern part of the WSA, activity on the roads in the Valley of the Gods intrude upon one's solitude. A portion of the Valley of the Gods has steep walls with open drainages, affording little screening from outside intrusions. Both the Valley of the Gods and lower Road Canyon are predominantly unscreened.

In summary, over 87 percent (45,720 acres) of the WSA has opportunities which meet the criteria for solitude, and 13 percent (6,700 acres) does not meet the criteria.

PRIMITIVE AND UNCONFINED RECREATION

The extensive canyon and plateau systems offer excellent opportunities for desert hiking and exploration. The rolling plateaus, winding canyons, talus slopes, knobs, buttes, pinnacles, alcoves, and other unique erosional features capture the attention of backpackers, dayhikers, climbers, and horseback riders. The area also has outstanding opportunities for sightseeing, photography, scientific, and educational studies. The outstanding archaeological resources are a major attraction for many recreationists.

The Cigarette Springs "cherry-stemmed" boundary road dissects into the unit from the west side, reducing the area having potential for primitive and unconfined recreation, but also providing access into this large unit. Part of the southern boundary road that circles Castle Butte restricts unconfined recreation, and the open character of the Valley of the Gods adjacent to the road inhibits a primitive recreation experience.

The effects of the Valley of the Gods road reduces Lime Creek, the West Fork of Lime Creek, and the other drainages to the south into short segments of a few miles each. This irregular configuration reduces the opportunities for an unconfined, primitive recreation experience in this portion of the WSA. The mesa between Road and Lime Creeks also has an irregular configuration due to the "cherry-stemmed" road and State sections which limit the unconfined recreation experience.

In summary, the north and east portions of the WSA, including Road and Barton Range Canyons (23,220 acres), meet the criteria for outstanding primitive and unconfined recreation opportunities. The southwestern portion of the WSA, including Lime Creek (29,200 acres), does not meet the outstanding recreation criteria because the irregular configuration limits the unconfined nature of the primitive experience.

SPECIAL FEATURES

Scenic and geological special values include the deep canyons cutting sheer cliffs into the red Cedar Mesa Sandstone. Twisting canyons offer dramatic views from the canyon rims. A portion of Valley of the Gods is included in the WSA where monolithic sandstone buttes rise 400 to 500 feet above the valley floor.

Road Canyon WSA contains a variety of topographic features including unique erosional forms of sandstone, towering pinnacles, steep-walled canyons, and gently sloping plateaus. This WSA incorporates four canyon systems that are typical of the Cedar Mesa area.

A high density of cultural resources (65 recorded and 6,100 potential sites) from both the Basketmaker and Pueblo stages of the Anasazi culture are present in the WSA. The Hole-in-the-Rock Trail, a National Register site, forms the unit's northeast boundary.

Land Use Plans and Controls

Ownership within and adjacent to the WSA is primarily Federal land administered by BLM.

There are three State sections presently without access in the WSA. Twelve State sections are adjacent to the WSA. The management philosophy for all State sections is to maximize economic returns for the State school fund. Present uses on these lands are livestock grazing and mineral exploration. There are no private or split estate lands in the WSA.

The area is readily accessible by way of U.S. Highway 191, State Highway 261, and three county roads.

The WSA is managed for multiple uses under BLM's South San Juan MFP (USDI, BLM, 1971a) which will be replaced by the San Juan RMP in 1986. The MFP recommended this area be evaluated for its primitive (wilderness) values; however, the plan also recommended oil and gas development within the planning unit be encouraged.

The *San Juan County Master Plan* (Planning and Research Associates, 1967) zones the WSA as

open range/forest lands or potential agricultural lands. The Master Plan predates wilderness considerations. However, the San Juan County Commission (1980) has pointed out that "nearly 20 percent" of the land in the county "has already been set aside for protection and preservation" and that the remainder of the county is "designated multiple use by our land use planning and zoning ordinance . . . the San Juan County Commission opposes any wilderness areas being legislatively or administratively designated in the County."

Socioeconomics

DEMOGRAPHICS

The WSA lies in central San Juan County. The nearest community is Bluff, approximately 10 road miles east of the WSA. The character of the county can be summarized as rural and sparsely populated.

San Juan County had a 1982 population of 12,700, not quite 1 percent of the state population (University of Utah, Bureau of Economic and Business Research, 1982). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers. Monticello, the county seat (about 50 road miles northeast of the WSA), had a 1980 population of 1,930, and Blanding (about 35 road miles northeast of the WSA) had a 1980 population of 3,120 (U.S. Department of Commerce [USDC], Bureau of the Census, 1981).

San Juan County is one of the largest counties in Utah, comprising 7,885 square miles (about the size of New Jersey). About 85 percent of the county is owned by the Federal Government, 6 percent by the State of Utah, and 8 percent by private land owners (University of Utah, Bureau of Economic and Business Research, 1982). The southern 20 miles of the county are included in the Navajo Indian Reservation.

EMPLOYMENT

Even though local employment in the mining industry has decreased by 20 percent between 1980 and 1982, due to a downturn in local uranium mining and milling, it still remains the largest local private employer (Utah Department of Employment Security, 1983).

Recent statistics as shown on Table 9 indicate that mining directly accounts for half of the income and over 32 percent of the employment in the county (USDC, Bureau of Economic Analysis, 1983). Because the mines and mine employees both purchase products locally, mining's total local importance is even greater. Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are on welfare and are therefore not included in unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

TABLE 9
1981 Employment and Income
San Juan County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance and Real Estate	1	1
Services	8	11
Other	-	-
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	96
Unemployment (First Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Source: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

Note: Employment percentage figures include only wages and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services. Because of rounding, numbers are not additive.

INCOME AND REVENUES

Past activities in the Road Canyon WSA that could be of some local economic consequence include livestock production and dispersed nonmotorized recreation.

Nineteen livestock operators have grazing privileges in the WSA. Based on the consumption of 1,450 AUMs of forage by cattle, it is estimated that the WSA accounts annually for $29,000 of livestock sales and $7,250 of ranchers' returns to

labor and investment. Appendix 9 identifies the multipliers used to estimate income and revenues.

Historical hunting pressure in the WSA has been low, and its local economic importance is insignificant.

The WSA does support private and commercial primitive recreation use. Judging from the points of origin, approximately 85 percent of the users pass through San Juan County's service centers. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced (Dalton, 1982). This study indicated that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for the Road Canyon WSA is estimated to average about 300 visitor days per year, for a total estimated income of $1,230. Only a portion of the expenditures for recreational use of the WSA contributes to the local economy of San Juan County.

For the most part, these recreation-related expenditures are well distributed within the local economy and are of low significance to any individual business. Recreation-related expenditures could be significant only to the one commercial outfitter using the WSA, who is not based locally. It is estimated that commercial use of the WSA accounts for an estimated $10,000 of sales. This money would not go to the local economy.

The WSA generates revenues to the Federal Treasury from three sources: mineral leases, grazing fees, and recreation use permits. Within the WSA, about 50,870 acres are currently leased for oil and gas. At $3 per acre, this generates up to $152,610 annually. Half of this, or about $76,305, is allocated back to the State of Utah. The State then reallocates these revenues to various funds, the majority of which are related to energy development.

Based on 1,450 AUMs of forage consumed by livestock in the WSA and a current grazing fee (as of March 1983) of $1.40, the WSA annually accounts for approximately $2,030 of grazing fee revenues. Half of this is allocated back to the local BLM district for construction of range improvement projects.

The recreation land use permit fees for commercial use of the WSA generate an average of about $200 of revenues annually.

Table 10 summarizes estimated local sales and revenues from the Road Canyon WSA.

TABLE 10
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases and Production	None	$152,610
Livestock Grazing	$29,000	$2,030
Recreational Use	Less than $1,239	$200
Forest Products[2]	None	None
Total	Less than $30,230	Up to $154,847

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total income that would be generated by these expenditures.

[2]Amount resulting from harvest solely within WSA is unknown, but is estimated at less than $50.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from: (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section

identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could likely occur in the area would be related to oil and gas exploration and development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown, but would probably be low. This would be due to the WSA's rough terrain and low mineral resource potential. The following is a worst-case analysis, based on the assumption that oil or gas would be developed sometime in the future, resulting in 160 acres of surface disturbance. (Appendix 10 gives mineral-related surface disturbance assumptions and estimates.) No surface disturbance related to development of other mineral resources is anticipated; however, 1,800 acres of surface disturbance could occur with the proposed vegetation treatment (chaining and seeding) for livestock.

AIR QUALITY

The WSA would continue to be managed as a Class II area under PSD regulations. Disturbance of 160 acres from energy development would result in minor temporary increases in fugitive dust emissions. Increased dust conditions also would occur during windy occasions for up to 2 years after implementation of the proposed land treatment. Because no major sources of air pollutant emissions are proposed in the vicinity of the WSA, overall air quality would remain essentially as at present.

GEOLOGY

No impacts to geology are expected because oil and gas exploration and development activities would probably not exceed 160 acres. These would involve surface disturbances and widely spaced wells that would not change the geologic structure of the area.

SOILS

It is estimated that up to 160 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.67 cubic yard/acre/year. Disturbance would increase the average rate of soil loss to 4.5 cubic yards/acre/year. Soil loss on the 160 disturbed acres would thus increase from 107 cubic yards/year to 720 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 613 cubic yards (2 percent) over the current annual soil loss of 35,383 cubic yards, to approximately 35,996 cubic yards per year.

VEGETATION

Because only 160 acres would be disturbed by mineral and energy exploration and development, no major changes in any of the vegetation types in the WSA would occur. The 1,800 acres of vegetation treatment would change the vegetation composition on those affected areas, reducing pinyon-juniper and increasing range grass species. In the long term, gradual reinvasion of pinyon-juniper would be expected to slowly occur, following the normal cycle of plant succession. *Astragalus cronquistii* and *Eriogonum clavellatum* are two plant species currently being reviewed by the FWS for possible listing as threatened or endangered that may be found within or near the WSA. Before authorizing surface-disturbing activities, the BLM would conduct site-specific clearances of the potentially disturbed areas. If these species could be affected, BLM would initiate informal consultation with the FWS as required by BLM policy. Because necessary measures would be taken to protect these plants, it can be reasonably concluded that the viability of populations of these sensitive plant species would be preserved under the No Action Alternative.

WATER RESOURCES

Since precipitation is low and there are no naturally occurring surface water sources within the WSA, no significant sedimentation or change in total dissolved solids (TDS) is expected to occur from the increase of 613 cubic yards of annual soil loss from surface disturbance. Oil and gas exploration and development in the area would generally be confined at or near the surface or with widely spaced wells and would not significantly change ground water quality or quantity. The good water quality of four springs in the Road Canyon WSA would be protected by stipulations on the oil and gas leases. Water sources could be developed in the future under this alternative; however, none are planned in the current MFP.

Overall, no impacts to water resources are anticipated with this alternative.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

The potential for up to 10 million barrels of oil and up to 60 billion cubic feet of natural gas (in-place) exists within the WSA. Up to 3 million barrels of oil and 18 billion cubic feet of gas would be recoverable. These oil and gas resources could be explored and developed, subject to Category 2 (special stipulations) on about 44,450 acres, and Category 3 (no surface occupancy) on about 6,420 acres. Approximately 1,550 acres would continue to be closed to leasing. Approximately 160 acres of surface disturbance would take place if exploration and development were to occur. Due to the small size of these potential deposits, as well as the low probability of occurrence, significant production is not expected under this alternative.

Locatable Minerals

The entire WSA would remain open to mining claim location. Development of any future mining claims would not be restricted by wilderness constraints. However, no locatable mineral deposits are projected to occur in this WSA, and, therefore, no disturbance would likely occur from exploration and development.

Salable Minerals

No development of salable minerals is likely and, therefore, no impact is expected.

WILDLIFE

As much as 160 acres of surface disturbance could occur from oil or gas exploration under this alternative. This is less than 1 percent of the area, and the resulting loss of forage would be insignificant. Mobile animals, such as mule deer, would leave the area of disturbance, and less mobile animal populations would be reduced during the time of disturbance. Because bald eagle are transients in the area, before authorizing any surface-disturbing activities BLM would consult with the FWS as required by the Endangered Species Act and by BLM policy. The BLM could request a biological opinion when appropriate (refer to Appendix 4). Because necessary measures would be taken to protect bald eagles, it can be assumed that no impact would occur to the species. There are no critical or crucial habitats that could be affected. Wildlife transplants into the WSA would be allowed. However, none are proposed or likely to occur in the foreseeable future.

Wildlife would benefit from increased forage resulting from the 1,800-acre chaining. There are no identified wildlife-related vegetation treatments or facilities planned within this WSA; therefore, no loss of potential improvements for wildlife would result.

FOREST RESOURCES

Limited juniper post cutting, firewood gathering, and pine nut gathering could continue in the WSA. This would be beneficial to firewood users because the Road Canyon WSA and the adjacent Cedar Mesa vicinity are the gathering areas. The 1,800-acre chaining would reduce the amount of pinyon-juniper vegetation but would temporarily increase the amount of harvestable dead-and-down wood, as would the 160 acres of disturbance related to oil and gas exploration and development. The less than 2,390 cords currently available for harvest would eventually be reduced by 13 percent to 2,084 available cords. This would not be significant because there are no commercial forest resources in the WSA.

LIVESTOCK

Domestic livestock grazing in the Road Canyon WSA would continue as authorized in the South San Juan MFP (currently 19 permittees and 1,450 AUMs) or other applicable planning documents. Existing range developments (6 miles of fence, two stock trails, 13 reservoirs, and one corral) could be used and maintained by motorized methods as in the past. Additional roads or livestock developments could be allowed in the future without regard for wilderness values. The currently proposed projects, including .5 mile of fence and 1,800 acres of vegetation treatment, could be implemented unconstrained by wilderness protection criteria. The 1,800 acres of proposed vegetation treatment could result in an additional 430 AUMs of livestock forage. Few, if any, changes in livestock management techniques are expected. The loss of forage from 160 acres of surface disturbance would be less than 1 percent of the WSA and would be insignificant.

VISUAL RESOURCES

Surface-disturbing impacts would be allowed under this alternative and would have the potential for adverse impacts. VRM class would remain as Class II on 28,830 acres, Class III on 19,400 acres, and Class IV on 4,190 acres. The scenic quality on portions of the 29,355 acres of Class A, 14,680 acres of Class B, and 8,385 acres of Class C could be degraded by up to 160 acres of surface disturbance.

Even though mitigative measures would be ap-

plied to minimize visual contrast created by intrusions (1,550 acres are Category 4, closed to leasing, and 6,420 acres are Category 3, no surface occupancy), visual values in areas affected by the estimated 160 acres of surface disturbance from oil or gas exploration and development would be degraded and VRM Class II management objectives would probably not be met in disturbed areas during the short term. After rehabilitation, visual resources would be restored to meet VRM objectives in most cases. Even after mitigation and rehabilitation, some permanent localized degradation could result where roads and cut or fill areas remain. Due to the low probability of extensive energy exploration and development and leasing stipulations, visual quality would probably not be significantly reduced in the Road Canyon WSA as a whole. The 1,800-acre chaining would reduce visual quality on 3 percent of the WSA, but would be designed to meet VRM class standards as much as possible.

CULTURAL RESOURCES

Disturbance of 160 acres (including additional roads and ways for motorized access) resulting from oil or gas exploration and development under this alternative has the potential to adversely affect cultural sites. However, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would lessen impacts. Also, surface disturbance would be limited to the 44,450-acre area managed as leasing Category 2 and would not occur throughout the WSA, so cultural values would be fully protected on the 7,970 acres in oil and gas leasing Categories 3 and 4. Still, some of the 65 recorded and 6,142 potential sites (4,095 of which would be potentially National Register eligible) could be disturbed. Vandalism of sites would be expected to increase in proportion to improved vehicular access and the general increase in workers or visitors in the area. Experience in other portions of the Cedar Mesa area indicates a direct correlation between additional vehicle access and sites vandalized for illegal artifact collection purposes.

On the other hand, if needed in the future, stabilization of cliff dwelling ruins and/or salvage excavation of sites could be completed without regard for wilderness considerations and would, therefore, be easier to conduct under this alternative.

RECREATION

Potential adverse impacts to the primitive and unconfined recreation experience could occur as a result of nondesignation. Surface-impacting activities would reduce the amount of land available for these types of activities. As much as 160 acres of surface disturbance could occur from oil and gas development. If roads were constructed throughout the area, the opportunities for primitive recreation would be reduced in the area as a whole. This is unlikely due to leasing stipulations and the low value of the area for the oil and gas resource. Motorized activities would be allowed and would be in conflict with nonmotorized users where their use areas overlap. The 7 miles of existing way (currently rehabilitated) could be used for motorized vehicle travel in the future, along with possible new roads and ways into the area. Motorized recreation users would benefit from lands being available for their use.

The future increase in recreational use of the WSA is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate, overall recreational use is expected to increase from 300 current average visitor days per year to an average of 450 visitor days per year at the end of 20 years. With basic road access to the area, the visitor attraction would center on primitive recreation use which would constitute nearly all of the estimated increase. Recreation activities based on the use of motorized vehicles (e.g., hunting, sightseeing, etc.) is almost nonexistent and would increase only slightly unless deer hunting is allowed by the State of Utah once again. There are no plans to restore deer hunting in the area.

WILDERNESS VALUES

None of the Road Canyon WSA would be designated wilderness, and management would continue under the existing South San Juan MFP until superseded by the San Juan Resource Area RMP. Wilderness values in the WSA (i.e., naturalness, opportunities for solitude and primitive recreation, and special features) would be lost or diminished in affected areas (as much as 160 acres) during the time of oil and gas exploration and development. The wilderness values would probably not be lost in the area as a whole due to the low value of the area for oil and gas resources and protective stipulations. No loss of wilderness values is expected from mining activities due to the lack of locatable mineral resources in the area. Disturbance from future livestock developments could occur, primarily from the proposed 1,800-acre vegetation treatment. Such actions would reduce naturalness of the area. Motorized use in the vicinity of the WSA would impact soli-

tude and primitive recreation opportunities, mainly along the WSA's southern boundary and on the benchlands between Lime Creek and Road Canyon. Use of the existing 7-mile way, 10 miles of "cherry-stemmed" road, and future roads and ways would reduce the outstanding solitude and primitive recreational values.

LAND USE PLANS AND CONTROLS

The applicable plans are the *San Juan County Master Plan* and the BLM South San Juan MFP. Implementation of this alternative would generally be consistent with both plans because land use would continue as at present. Continuation of the closure of 1,550 acres to oil and gas leasing would not be consistent with the county's concept of multiple use. This alternative would be consistent with State of Utah plans and policies which emphasize economic return.

SOCIOECONOMICS

Overall, no changes in existing patterns or trends of population, employment, or distribution of local income would be expected. There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the potential oil and gas resource in the WSA were developed, it would lead to increased employment and income for San Juan County. However, the probability of economic development of this resource within the WSA is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

The ability to maintain, replace, and build new range improvements would remain as at present. The proposed 1,800-acre vegetation treatment that would produce 430 AUMs of new allocated forage could lead to $8,600 of livestock sales and $2,150 of ranchers' returns to labor and investment in addition to that currently received from 1,450 AUMs.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase only about 150 visitor days per year over the next 20 years and overall recreation-related expenditures average only $4.10 per visitor day (only a portion of which contributes to the local economy), an increase in annual recreation-related expenditures of about $615 attributable to the WSA would likely not be significant to the local economy.

Federal and State revenues would not be affected by this alternative. No acres in the WSA are open to oil and gas leases that are not currently leased. Collection of livestock grazing fees could increase from the current $2,030 per year to $2,632 per year if 430 AUMs are gained and allocated from the 1,800-acre vegetation treatment. Revenues from commercial recreational use permits could increase from the current $200 to $300 at the end of 20 years due to increases in recreational use.

All Wilderness Alternative (52,420 Acres)

As cited in the Description of the Alternatives section, the major changes that could occur in the 52,420-acre area would be related to closure to new mineral leasing and restrictions on vehicle access. The entire area would be placed in oil and gas leasing Category 4 (closed to leasing). The entire area, including about 7 miles of existing vehicular way in the WSA, would be closed to vehicular use except for approvals by BLM, as noted in the Description of the Alternatives section. Vegetation treatment on 1,800 acres for livestock forage would not be allowed. The WSA would be managed under VRM Class I.

For the following analysis it is assumed that existing oil and gas leases would expire before production of commercial quantities and that oil and gas leases would not be renewed and future leasing of oil and gas would not be allowed. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates for the WSA.)

Because potentially disturbed areas for this alternative would be smaller than under the No Action Alternative (0 vs. 1,960 acres if 1,800 acres of vegetation treatment are included), anticipated impacts to air quality, geology, water, vegetation, wildlife, livestock, and forest resources for the All Wilderness Alternative would be less than those described for the No Action Alternative. Wilderness designation would provide additional protection to these resources because it would reduce the potential for disturbance. Other effects on these resources due to changes in management are addressed below.

SOILS

The soil resource would benefit because surface-disturbing activities are not anticipated under this alternative. Soil loss from erosion could be expected to continue at the current level of 35,383 cubic yards annually within the WSA. This would be about 613 cubic yards per year less soil loss than under the No Action Alternative. The poten-

tial for agricultural development of portions of the WSA would be foregone under this alternative. Nothing is currently proposed or likely even without wilderness designation.

WATER RESOURCES

The opportunity to develop watershed improvements would be less than under the No Action Alternative. No watershed improvements are currently proposed, however.

VEGETATION

Alteration of vegetation composition on 1,800 acres would not occur under this alternative. The entire WSA would remain covered primarily with desert shrub and pinyon-juniper. In the long term, the trend would be towards increased amounts of pinyon-juniper as the successional climax vegetation type.

Inadvertent disturbance of the sensitive plant species *Astragalus cronquistii* and *Eriogonum clavellatum* likely would not occur with implementation of this alternative.

MINERAL AND ENERGY RESOURCES

None of the minerals on the National Defense Stockpile Inventory of Strategic and Critical Materials are known to occur within the WSA. An all wilderness designation for the area would have no effect upon the nation's ability to meet domestic production demands for critical mineral needs.

Leasable Minerals

Although almost all of the WSA is under oil and gas lease (43,550 acres of existing leases are pre-FLPMA and 7,320 acres are post-FLPMA), no exploration or development of oil and gas is presently occurring within the WSA. Existing pre- and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases will be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases will not be reissued.

Exploration for and development of a potential resource of less than 10 million barrels of oil or less than 60 billion cubic feet of natural gas (in-place), with 3 million barrels of oil or 18 billion cubic feet of natural gas considered recoverable, would be foregone under this alternative. However, due to the expected small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities even without wilderness designation, it is concluded that this alternative would not result in any significant loss of potential oil and gas recovery.

Locatable Minerals

There are no probable locatable minerals, no existing mining claims, and no mining claims expected to be located prior to wilderness designation. Development work, extraction, and patenting would not occur under this alternative, but would be unlikely to occur under the No Action Alternative as well. This alternative would thus have no impact on the ability to recover locatable minerals, and no mineral potentials would be foregone.

Salable Minerals

No salable mineral activities are expected and, therefore, none would be foregone in the Road Canyon WSA.

WILDLIFE

Overall, wildlife would benefit from wilderness designation due to the elimination of potential oil and gas related disturbance and vehicular access. Wilderness designation would result in limitations on potential wildlife improvement, but this is an insignificant problem because no wildlife improvements are currently planned in the area. However, any benefit from increased forage from the 1,800-acre planned vegetation treatment for livestock would be foregone.

FOREST RESOURCES

Under this alternative, no woodland harvest would occur other than incidental use of dead-and-down firewood by recreationists and noncommercial pine nut gathering. Vegetation products could not be cut or sold if the WSA were designated wilderness. The use of an estimated less than 2,390 cords of fuelwood would be foregone with designation. Overall, this would not result in a substantial loss of harvest of the forest resource due to the limited existing use in the WSA and availability of these resources closer to population centers. This is, however, a firewood gathering area, and its closure to wood harvest could be a hardship to some. The resource would be maintained because the planned 1,800-acre vegetation treatment would not be allowed under this alternative.

LIVESTOCK

Grazing use would continue with no substantial change. The 19 operators with cattle and horse use could continue to utilize the estimated 1,450 AUMs within the WSA. The Road Canyon WSA includes only from 1 to 18 percent of the AUMs in the four allotments affected; therefore, wilderness designation is not expected to have a substantial influence on overall livestock operations in those allotments. The existing range projects

(13 reservoirs, 6 miles of fence, two stock trails, and one corral) would have to be maintained by nonmotorized means where practical, but could be maintained by vehicle use if necessary. The proposed project, a fence, would be allowed in the WSA, but would have to be constructed in a manner compatible with the wilderness setting. The 1,800 acres of proposed land treatment and an associated additional 430 AUMs would be foregone with designation. Development of future roads or other livestock management facilities for use in the WSA could be restricted to preserve wilderness values.

VISUAL RESOURCES

Wilderness designation would result in the preservation of the area's high quality visual resources. The outstanding scenic quality of the WSA would benefit by wilderness designation because surface-impacting activities would be limited. The 52,420 acres in the WSA would be upgraded to a VRM Class I. As a result, any developments would be designed to blend into the existing character of the landscape in accordance with Appendix 1. The 29,355 acres of Class A (high quality) scenery, 14,680 acres of Class B scenery, and 8,385 acres of Class C scenery would be protected.

CULTURAL RESOURCES

Wilderness designation would benefit cultural resources by limiting the amount of surface-disturbing activity (especially additional roads) and by restricting motorized access. Experience in other portions of this resource area indicates a direct correlation between additional access and sites vandalized for illegal artifact collection. The 65 recorded and 6,142 potential sites (4,095 of which are potentially National Register eligible) would thus be better protected with this alternative than with the No Action Alternative due to less susceptibility to vandalism. However, if wilderness designation resulted in large increases in additional visitation into the WSA, the potential would exist for accelerated deterioration of the more accessible cultural sites. Stabilization and scientific excavation would be allowed, but would have to be completed in a manner compatible with the wilderness setting. Still, the protection afforded by wilderness management would outweigh problems from increased recreational activity and restrictions on cultural resource management.

RECREATION

Although use is currently low (approximately 300 visitor days per year), portions of the WSA have outstanding primitive recreational values. If designated wilderness, the Road Canyon WSA's outstanding opportunities for dayhiking, backpacking, horseback riding, and sightseeing would be recognized, managed, and preserved. As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. With wilderness designation, use of the WSA would probably increase at an accelerated rate due to additional public awareness of the values present. Publicity of the WSA that would likely follow wilderness designation could lead to an undetermined increase in primitive recreational use above the baseline rate. Judging from use densities of a number of well known wilderness areas, proposed wilderness areas, and primitive areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites, it is estimated that use could be as much as 10,484 visitor days per year following designation. This would be 10,184 visitor days over the area's current estimated 300 annual visitor days. This is considered to be a maximum number that may not be attained if several nearby WSAs (i.e., Fish Creek Canyon and Mule Canyon) also are designated as wilderness, thereby creating competition for wilderness use. Management provided through a Wilderness Management Plan would regulate excessive increases in future recreation use, and the quality of the primitive recreation experience probably would not be negatively affected by the increased use. Use of ORVs in the Road Canyon WSA is minimal, and closure of the WSA to vehicle use would result in little change from the current situation. The 10 miles of "cherry-stemmed" road would remain open providing vehicular access to scenic portions of the area. Designation would eliminate the potential for conflicts between nonmotorized and motorized recreation users. The nonmotorized recreation activities would be enhanced due to the limitation of surface-impacting activities and the elimination of motorized vehicle use.

WILDERNESS VALUES

The wilderness values of naturalness and special features on 52,420 acres in this WSA would be protected through wilderness designation by Congress. Naturalness would be enhanced due to the restrictions on surface-disturbing activities and motorized uses. No surface disturbance from mineral development is anticipated under this alternative.

There are 7 miles of way that have been rehabilitated but could still be used by ORVs. Closure to

general public vehicle use would enhance and protect the wilderness values present, as the way would slowly reclaim through rehabilitation and natural processes. With the amount of increased use noted above, it is projected that an average of about 52 visitors per day would be expected during the high-use season (May through September). If these visitors were dispersed throughout the 52,420-acre wilderness, no loss of solitude would be experienced. However, if all of the use were concentrated in Lime and Road Canyons, some loss of solitude could result; however, use would be controlled through a Wilderness Management Plan to avoid loss of outstanding opportunities for solitude and primitive and unconfined recreation.

Outstanding opportunities for solitude on 45,720 acres and primitive and unconfined recreation on 29,200 acres would be preserved. This alternative would include the area determined not to contain outstanding opportunities for solitude (6,700 acres) and primitive and unconfined recreation (23,220 acres).

Wilderness designation of 52,420 acres would help to protect the special features present. The scenic values, cultural resource sites, and historic values would be less likely to be adversely affected by nonwilderness activities than with the No Action Alternative.

The 10-mile "cherry-stemmed" Cigarette Springs road could present manageability problems, because physically closing adjacent areas to motorized use would be difficult due to the open terrain. Also, with the 10 miles of road and 3 State sections "cherry-stemmed" into the center of the Road Canyon WSA, wilderness values in that area might not be fully protected because vehicular access and decreased opportunities for solitude could occur there. If designated wilderness, specific management actions would be needed to maintain outstanding opportunities for solitude and primitive and unconfined recreation.

LAND USE PLANS AND CONTROLS

The existing BLM South San Juan MFP identifies management for primitive resource values but does not provide for formal wilderness designation. The forthcoming San Juan RMP will acknowledge the wilderness study process but will not address wilderness designation. Congressional designation of the WSA as wilderness would be an amendment to the MFP or the San Juan Resource Area RMP which will supersede the MFP.

The *San Juan County Master Plan* zones the area of the WSA as open range/forest lands or potential agricultural lands. Designation would conflict with forest and agricultural uses. The county prefers multiple use of all public lands in the county. This alternative would conflict with the county's multiple-use concept: use would be allowed under more restrictive conditions and oil and gas leases would be phased out. Wilderness designation would result in exchange of State land in-holdings and due to the exchange, it is assumed that there would be no conflict with the policy of the State of Utah to maximize economic returns.

SOCIOECONOMICS

Overall there would be no significant changes in current trends of population, employment, and local income distribution.

Because of restrictions placed on the use of resources under wilderness designation, there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 10) as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative.

The potential for mineral development in the WSA is low (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Pre-FLPMA oil and gas leases could be developed, but designation would preclude new leases and mining claims from being established in the WSA. Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they could be with mineral development under the No Action Alternative. However, because the potential for mineral development is low, it is estimated that potential mineral-related local income would not be significantly reduced by wilderness designation.

Annual livestock use and ranchers' income would continue as at present with $29,000 of livestock sales and $7,250 of ranchers' return to labor and investment. Proposed improvements for livestock would be foregone along with any resulting increase in ranchers' income. The proposed 1,800-acre vegetation treatment project that would produce 430 additional AUMs annually along with about $2,150 annual ranchers' returns to labor and investment and $8,600 of livestock sales would be foregone under this alternative.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section).

At the higher levels of projected use with designation, expenditures associated with recreation in the WSA would account for an estimated $42,984 annually of locally earned income. These expenditures would be well distributed among businesses in San Juan County, but could be of some local significance. By increasing public awareness, designation could also increase the demand for commercial outfitter services and significantly affect their sales.

Motorized recreational use of the WSA is light, and the decrease in related local expenditures would be small and insignificant to both the local economy and individual businesses.

The loss of leases on 50,870 acres now leased would cause an eventual loss of up to $152,610 per year of lease fees to the Federal Treasury, half of which would have been allocated to the State.

If the proposed 1,800-acre vegetation treatment project is not developed and used, an estimated annual $602 of Federal grazing revenues from the 430-AUM increase would be foregone.

Wilderness designation would eliminate most woodland product harvesting and related Federal revenues. Potential harvest from the WSA is slight.

Recreation-related Federal revenues could increase from the present estimated $200 per year if the demand for commercial outfitter services increases. There is presently one commercial recreation group using the WSA and designation could lead to more commercial recreational use in the WSA.

Partial Wilderness Alternative (45,720 Acres) (Proposed Action)

The major activities that would occur in the designated portion of the WSA for this alternative are the same as described for the All Wilderness Alternative. For the nondesignated portion, management would be as described for the No Action Alternative. The specific actions that would take place within the 45,720-acre area designated as wilderness and the 6,700-acre nondesignated area are discussed in the Description of the Alternatives section.

It is assumed that, due to lack of mineral values, there would be no mining claims filed anywhere in the WSA prior to designation. Also, it is assumed that existing oil and gas leases in the designated portion would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing of oil and gas would not be allowed in the designated area.

It is assumed that, within the nondesignated area, only 20 acres would be disturbed sometime in the future due to oil and gas exploration and development. Overall, 20 acres of surface disturbance would occur within the WSA, 1,940 acres less than under the No Action Alternative (if the 1,800-acre chaining is included) and 20 acres more than with the All Wilderness Alternative. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates for the WSA.)

The analysis of the No Action Alternative, based on 160 acres of surface disturbance related to oil and gas development and 1,800 acres of disturbance due to vegetation treatment, shows that full development of potential resources with associated surface disturbance would not significantly affect air quality, geology, soils, vegetation, water, forest, wildlife, livestock, and cultural resources. Therefore, these resources would not be significantly affected by this Partial Wilderness Alternative, which assumes 20 acres of surface disturbance.

Restrictions on management and development methods within the WSA would result in essentially the same impacts on development of water sources, mineral and energy resources, wildlife, livestock grazing, and land use plans as described for the All Wilderness Alternative. The following analysis describes the differences between the 45,720-acre Partial Wilderness, No Action, and All Wilderness Alternatives.

SOILS

It is estimated that up to 20 acres of soil could be disturbed by mineral exploration and development. All disturbance would occur within the nondesignated area. The average rate of soil loss in the WSA at present is estimated at 0.67 cubic yard/acre/year. If disturbed the rate would increase to 4.5 cubic yards/acre/year. Soil loss in the designated portion would remain the same. Soil loss in the nondesignated portion on the 20 disturbed acres would increase from 13 cubic yards/year to 90 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this Partial Wilderness Alternative, maximum annual soil loss within the WSA would increase by approximately 70 cubic yards (.2 percent) over current annual soil loss. This would be 543 cubic yards less than the No Action Alternative.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

The area that would be designated wilderness would be placed in Category 4 status with no new leasing. There are approximately 44,340 acres of oil and gas leases in the area that would be designated wilderness; 38,320 acres are pre-FLPMA and 6,020 acres are post-FLPMA. Activities on these leases would occur subject to the stipulations issued at the time of leasing.

It cannot be determined how much of the existing potential resource of 10 million barrels of in-place oil and less than 60 billion cubic feet of natural gas falls within the area that would be designated as wilderness under this alternative. Of these amounts, 3 million barrels of oil and 18 billion cubic feet of natural gas are estimated to be recoverable. Assuming that the loss of potential resource recovery would be in direct proportion to the size of the area designated, exploration and development of a potential resource of up to 2.5 million barrels of oil and 15.3 billion cubic feet of natural gas could be foregone. This would allow recovery of .5 million more barrels of oil and 2.7 billion more cubic feet of natural gas than with the All Wilderness Alternative. Due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood for exploration and development activities even without wilderness designation, this alternative is not expected to result in any significant loss in recovery of the oil and gas resource.

Locatable and Salable Minerals

No development, impacts, or resource opportunities foregone are expected for these minerals.

LIVESTOCK

Designating 45,720 acres of the WSA as wilderness would affect domestic livestock grazing essentially the same as with the All Wilderness Alternative. Of the 1,450 AUMs allocated, 950 would be within the designated portion of the WSA and 500 within the nondesignated portion. Development of future roads or other livestock management facilities for use with 950 AUMs in the designated portion could be restricted to preserve wilderness values. The 7-mile way would not be available for use; however it has been rehabilitated and is currently not used. Therefore, formal closure would not be a hardship on livestock operations. The 1,800-acre vegetation treatment project planned in the designated portion would not be allowed, with a resulting 430-AUM increase foregone as with the All Wilderness Alternative. The nondesignated portion would include only the Perkins Brothers Allotment.

VISUAL RESOURCES

Because total surface disturbance in the WSA would be 20 acres under this alternative as opposed to 160 acres under No Action and none under All Wilderness, the impact on visual resources would be less than under the No Action Alternative and slightly more than under the All Wilderness Alternative. In the portion that would be designated, no surface disturbance could result from mineral exploration and development. VRM Class I would be applied to 45,720 acres in the designated part of the WSA, while the nondesignated part would remain Class II on 1,600 acres and Class III on 5,100 acres. All Class A (high quality) scenery in the WSA would be within the designated area. In the nondesignated area, the scenic quality on 1,600 acres of Class B and 5,100 acres of Class C scenery would not be protected. Approximately 20 acres in the nondesignated portion of the WSA could be disturbed and, although mitigative measures would be applied to minimize visual contrast created by mineral-related surface disturbance, VRM Class II and Class III objectives would probably not be met during the short term. This disturbance would not significantly affect visual resources in the WSA as a whole. Even after rehabilitation some permanent localized degradation could be expected in the nondesignated part of the Road Canyon WSA.

CULTURAL RESOURCES

Impacts to cultural resources with this alternative would be essentially the same as with the All Wilderness Alternative because the majority of the known archaeological sites are in the area that would be designated.

RECREATION

Impacts on recreational values and opportunities for the 45,720-acre area that would be designated as wilderness would be as described in the All Wilderness Alternative. Wilderness-oriented recreational use could increase up to about 9,144 visitor days per year due to increased public awareness as a result of wilderness designation. Because wilderness designation on 45,720 acres would reduce the potential for surface disturbance, the quality of the primitive recreational experience would likely be preserved throughout the designated area. Limited impact on ORV recreational use would be expected due to the low amount of such activity in the area. The approximately 7 miles of way within the WSA would be formally closed to ORV use; however, the way is currently not in use anyway. Vehicular access on

the 10 miles of the Cigarette Springs "cherry-stemmed" road would continue.

In the area that would not be designated (6,700 acres), disturbance of up to 20 acres from oil and gas exploration and development, although unlikely, would reduce primitive recreation values in the affected area, but could improve access for nonprimitive recreation. The possible reduction in primitive values would not occur in the WSA as a whole.

WILDERNESS VALUES

Impacts to wilderness values would be the same as under the All Wilderness Alternative on the 45,720 acres that would be designated wilderness. Size, naturalness (the entire acreage meets the criteria), outstanding opportunities for solitude (the entire acreage meets the criteria) and primitive recreation (23,220 acres meet the criteria), and special features would be preserved. Although recreational use could increase substantially (refer to the Recreation section under this alternative), use relative to the size of the area would be relatively low: estimated to average about 45 visitors per day during the high-use season (May through September). If this use were concentrated in the canyons of the WSA, some effect on solitude and primitive recreation values would be expected. However, this would be controlled through a Wilderness Management Plan to avoid loss of outstanding opportunities for solitude and primitive and unconfined recreation. No development of leases within the designated portion is foreseen under this alternative. Sights and sounds from activities resulting from 20 acres of disturbance within the 6,700-acre area that would not be designated would not result in significant loss of solitude and primitive recreational values within the designated portion.

In the 6,700-acre area that would not be designated, there would be only 20 acres of disturbance from mineral and energy exploration and development activities. Those activities would degrade wilderness values of naturalness (the entire acreage meets the criteria) and special features. This area does not have outstanding opportunities for primitive recreation or solitude.

LAND USE PLANS AND CONTROLS

This alternative would be generally the same as the Land Use Plans and Controls section as described for the All Wilderness Alternative, with the exception of the 6,700 acres not designated. The nondesignated area would be consistent with existing land use plans. The designated portion would not be consistent with the multiple-use concept of the *San Juan County Master Plan* because mineral and some forestry and agricultural uses would not be allowed. Partial designation would require an amendment to the applicable BLM land use plan.

SOCIOECONOMICS

Partial designation of 45,720 acres of the Road Canyon WSA is not expected to result in any changes in existing patterns and trends of population, employment, and local income distributions. The 1,450 AUMs would remain available to cattle in the Slickhorn, Texas-Muley, Perkins Brothers, and Comb Wash Allotments. Loss of future income and Federal revenues from 430 increased AUMs associated with the proposed vegetation treatment would be foregone, the same as the All Wilderness Alternative. Approximately $133,020 per year in Federal oil and gas leasing revenue, $19,590 less than with the All Wilderness Alternative, would be lost as leases were phased out. This revenue would not be generated for State programs. At the higher levels of projected use with partial designation, expenditures associated with recreation in the WSA would account for an estimated $37,490 per year of locally earned income. These expenditures would be well distributed among businesses in San Juan County, but could be of some local significance.

Partial Wilderness Alternative (23,220 Acres)

The major activities that would occur in the designated portion of the WSA for this alternative are the same as described for the All Wilderness Alternative. For the nondesignated portion, management would be as described for the No Action Alternative. The specific actions that would take place within the 23,220-acre area designated as wilderness and the 29,200-acre nondesignated area are discussed in the Description of the Alternatives section.

It is assumed that, due to lack of mineral values, there would be no mining claims anywhere in the WSA. Also, it is assumed that existing oil and gas leases in the designated portion would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing of oil and gas would not be allowed in the designated area.

It is assumed that, within the nondesignated area, 90 acres would be disturbed sometime in the future due to oil and gas exploration and development. In the nondesignated area approximately

1,000 acres of vegetation treatment would also occur resulting in 1,000 more acres of disturbance. Overall, 1,090 acres of surface disturbance would occur within the WSA; 870 acres less than under the No Action Alternative, 1,090 acres more than with the All Wilderness Alternative, and 1,070 acres more than the Partial Wilderness Alternative of designating 45,720 acres. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates for the WSA.)

The analysis of the No Action Alternative, based on 160 acres of mineral-related surface disturbance and 1,800 acres of vegetation treatment, shows that full development of potential resources with associated surface disturbance would not significantly affect air quality, geology, soils, vegetation, water, wildlife, livestock, forest, and cultural resources. Therefore, these resources would not be significantly affected by this Partial Wilderness Alternative which assumes 1,090 acres of surface disturbance (including the vegetation treatment).

Restrictions on management and development methods within the WSA would result in essentially the same impacts on development of water sources, mineral and energy resources, wildlife, livestock grazing, and land use plans as described for the All Wilderness Alternative. The impacts of designating 23,200 acres of wilderness in the WSA would generally be of the same nature as those resulting from designation of 45,720 acres as wilderness. An additional 70 acres of surface disturbance related to oil and gas exploration and development could occur, although the location of the impacts would be different.

SOILS

It is estimated that up to 90 acres of soil could be disturbed by mineral exploration and development. All disturbance would be in the nondesignated area. The average rate of soil loss in the WSA at present is estimated at 0.67 cubic yard/acre/year. If disturbed the rate would increase to 4.5 cubic yards/acre/year. Soil loss in the designated portion would remain the same, and loss in the nondesignated portion on the 90 acres would increase from 60 cubic yards/year to 405 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this Partial Wilderness Alternative, maximum annual soil loss within the WSA would increase by approximately 345 cubic yards (.98 percent) over current annual soil loss. This would be 263 cubic yards less than the No Action Alternative.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

The area that would be designated wilderness would be placed in Category 4 status, with no new leasing. There are approximately 21,895 acres of oil and gas leases in this area (20,735 acres are pre-FLPMA and 1,160 acres are post-FLPMA). Activities on these leases would occur subject to the stipulations issued at the time of leasing.

It cannot be determined how much of the existing potential resource of 10 million barrels of in-place oil and less than 60 billion cubic feet of natural gas is within the area that would be designated as wilderness under this alternative. Of these amounts, 3 million barrels of oil and 18 billion cubic feet of natural gas are estimated to be recoverable. It is assumed that the loss of potential resource recovery would be in direct proportion to the size of the area designated; therefore, a potential resource of up to 1.3 million barrels of oil and 8 billion cubic feet of natural gas would be foregone. This would allow recovery of 1.7 million more barrels of oil and 10 billion more cubic feet of natural gas than with the All Wilderness Alternative.

Due to the small size of potential deposits, the low certainty that these exist, and the low likelihood for exploration and development activity, even without wilderness designation, this alternative is not expected to result in any significant loss in recovery of the oil and gas resource.

Locatable and Salable Minerals

No development, impacts, or resource opportunities foregone are expected for these minerals.

LIVESTOCK

Designating 23,220 acres as wilderness would affect domestic livestock grazing essentially the same as with the All Wilderness Alternative. Of the 1,450 AUMs allocated, 736 would be within the designated portion of the WSA and 714 within the nondesignated portion. Development of future roads or other livestock management facilities for use with the 736 AUMs in the designated portion could be restricted to preserve wilderness values. The existing range projects in the designated portion (one reservoir, 2 miles of fence, and two stock trails) would have to be maintained by nonmotorized means except where motorized maintenance is necessary. The existing projects (12 reservoirs, 4 miles of fence, and one corral) in the nondesignated portion could be maintained by motorized means. The proposed project (one fence) in the nondesignated portion could be constructed unconstrained by wilderness stipulations. About

800 acres (190 AUMs) of the proposed 1,800-acre vegetation treatment in the designated portion would be foregone and about 1,000 acres (240 AUMs) in the nondesignated portion could be implemented without wilderness considerations. This ultimately would result in future livestock use totaling 1,690 AUMs. The 7-mile way would be in the nondesignated portion. Possibly this and future roads or management facilities would be developed and used without concern for wilderness values.

VISUAL RESOURCES

Because total surface disturbance in the WSA would be 1,090 acres under this alternative, as opposed to 1,960 acres under the No Action Alternative, 0 acres under the All Wilderness Alternative, and 20 acres under the 45,720-acre Partial Wilderness Alternative, the impact on visual resources would be slightly less than under the No Action but greater than under the other two alternatives.

Surface-disturbing activities would not be allowed on the designated wilderness portion (23,220 acres), thereby protecting the visual resource. Activities would be allowed on the nondesignated portion (29,200 acres) and would have potential for adverse impacts. The VRM class would be upgraded to a Class I on 23,200 acres in the designated area and would remain Class II on 13,930 acres, Class III on 12,980 acres, and Class IV on 2,290 acres in the nondesignated area. In the designated area scenic quality would be protected on 15,425 acres of Class A scenery, 5,895 acres of Class B scenery, and 1,900 acres of Class C scenery. The scenic quality on 13,930 acres of Class A, 8,785 acres of Class B, and 6,485 acres of Class C scenery would not be protected.

CULTURAL RESOURCES

Cultural resources in the designated portion would receive protection; however, cultural sites in the nondesignated part of the Road Canyon WSA could be susceptible to inadvertent loss due to 1,090 acres of surface disturbance and to increased vandalism due to possible additional road access. The nondesignated portion contains three recorded sites and 3,418 potential sites (2,281 of which are potentially National Register eligible). In the designated portion, benefits from designation would override increased vandalism that could occur due to increased visitor use.

RECREATION

Impacts on recreational values and opportunities for the 23,220-acre area that would be designated as wilderness would be of the same type described for the All Wilderness Alternative. Recreational use could increase to 4,644 visitor days per year. Because wilderness designation on 23,220 acres would reduce the potential for surface disturbance, the quality of the primitive recreational experience would likely be preserved throughout the designated area.

Although unlikely, primitive recreation values could equally be reduced in the area that would not be designated. Although currently not used for vehicular access, the 7 miles of existing way could possibly be used for future access along with future roads that may occur from oil and gas exploration.

WILDERNESS VALUES

Impacts to wilderness values generally would be the same as under the All Wilderness Alternative on the north and east portion of the WSA that would be designated wilderness. Designation and management of 23,220 acres of the WSA as wilderness would ensure the preservation of the wilderness values of size, naturalness, and opportunities for solitude and primitive and unconfined recreation in the designated portion of the Road Canyon WSA. The designated portion would include all of the area in the WSA with outstanding opportunities for primitive and unconfined recreation. The entire 23,220 acres meet the *Wilderness Act* standards for all the criteria. Although recreational use could increase substantially (refer to the Recreation section under the All Wilderness Alternative), use relative to the size of the area would be low, estimated at approximately 23 visitors per day during the high-use season (May through September). If this use were concentrated in the canyons of the WSA, some effect on solitude and primitive recreation values would be expected. However, this would be controlled through a Wilderness Management Plan to avoid loss of outstanding opportunities for solitude and primitive and unconfined recreation. Sights and sounds from activities leading to 1,090 acres of disturbance in the 29,200-acre nondesignated area would not result in significant loss of solitude and primitive recreational values within the designated portion.

No development of leases, locatable minerals, or land treatments within the designated portion is foreseen under this alternative. Wilderness designation on 23,220 acres would thus protect the special features present in this portion. Within this area there are 62 recorded and 2,724 potential cultural resource sites (1,814 of which are potentially National Register eligible) that would be protected along with historic and scenic values.

In the 29,200-acre area that would not be designated as wilderness, the 1,090 acres of disturbance from energy exploration and development and land treatments would degrade wilderness values (naturalness [the entire acreage meets this criteria], special features, and outstanding opportunities for solitude [22,500 acres meet this criteria]) from the commencement of activities through rehabilitation. Thus, some long-term impairment of wilderness values in the portion that would not be designated would be expected.

LAND USE PLANS AND CONTROLS

This alternative would relate to Land Use Plans and Controls as described for the 45,720-acre Partial Wilderness Alternative, except the acreage that would be consistent with existing land use plans would be larger (29,200 acres compared to 6,700 acres).

SOCIOECONOMICS

Partial designation of this WSA is not expected to result in any changes in existing patterns and trends in population, employment, and local income distributions. The 1,450 AUMs would remain available to cattle in four allotments in the WSA. Future increased income and revenues of about $4,800 in livestock sales, $1,200 in return to ranchers, and $336 in Federal grazing fees could be attained and attributed to the increased 240 AUMs from 1,000 acres of vegetation treatment in the nondesignated part of the Road Canyon WSA. Approximately $65,685 per year in Federal oil and gas lease revenue, $86,925 less than with the All Wilderness Alternative, would be lost as leases were phased out. This revenue would not be generated for State programs. At the higher levels of projected use with partial designation, expenditures associated with recreation in the WSA would account for an estimated $19,040 per year of locally earned income. These expenditures would be well distributed among businesses in San Juan County, but could be of some local significance.

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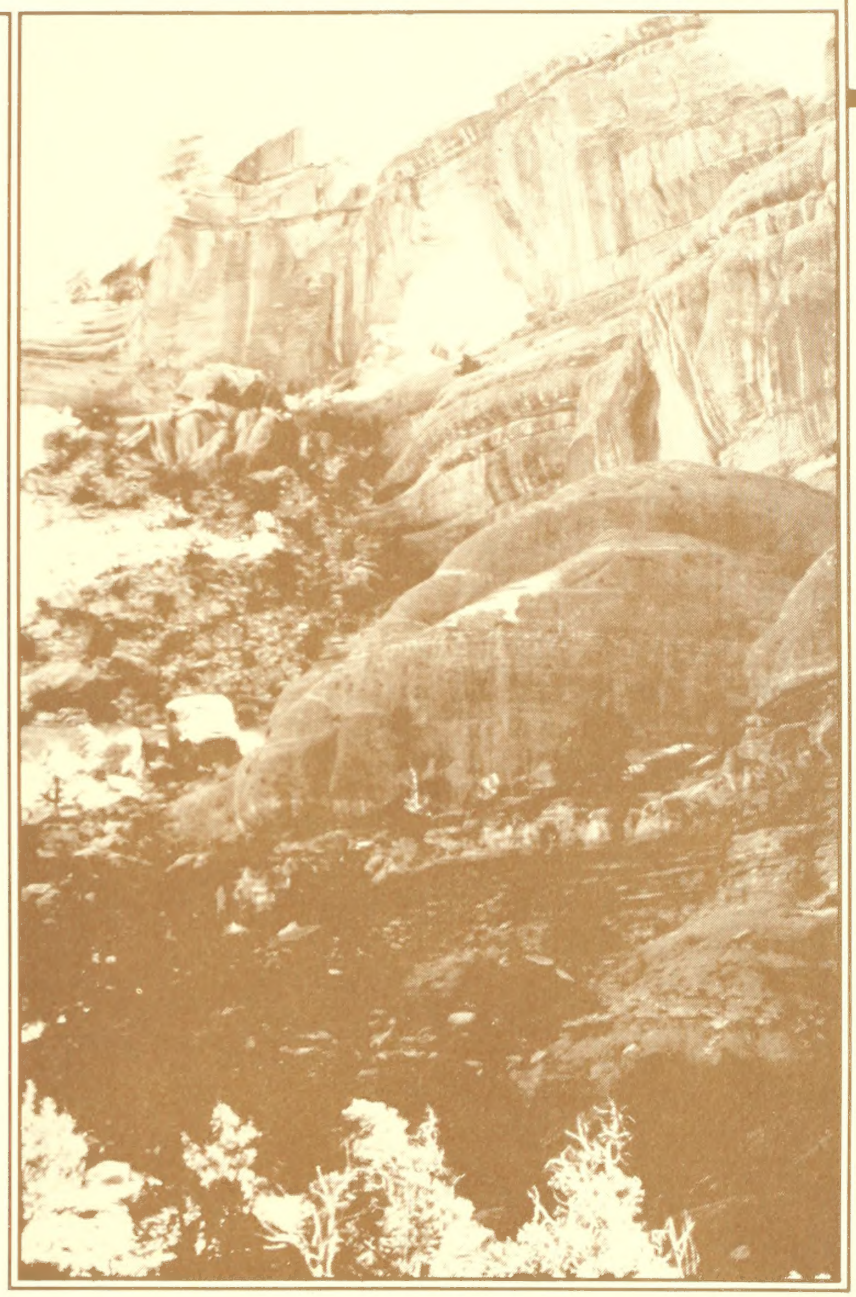
Fish Creek Canyon WSA



FISH CREEK CANYON WSA
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(UT-060-204)

INTRODUCTION

General Description of the Area

The Fish Creek Canyon Wilderness Study Area (WSA) contains approximately 46,440 acres of public land administered by the BLM. It is located about 29 miles southwest of Monticello, Utah and 12 miles southwest of Blanding, Utah.

The configuration of the WSA is roughly that of a rectangle, about 17 miles long and from 3 to 7 miles wide. The WSA is bounded by the old State Highway U-95 right-of-way on the north, section lines and Comb Wash road on the east, by the historic Hole-in-the-Rock Trail on the south, and by a road, State section, and chaining on the west. A road and State section have been "cherry-stemmed" out of the western portion of the unit.

The entire WSA is situated on the Grand Gulch Plateau, also known as Cedar Mesa. Fish and Owl Creeks form the main canyons of this WSA, but Dry Wash and McCloyd Canyons also cut deeply into the Cedar Mesa Sandstone. The pinyon-juniper-covered plateau ranges in elevation from 6,800 feet on the north to about 5,300 feet on the south. The pinyon-juniper is dense with interspersed sage flats. Ponderosa pines are also found in the drainages of the northern part of the WSA. The mesa top topography gently undulates between dry washes and major canyons. In a few places, slickrock is exposed in formations on the mesa.

Fish Creek Canyon meanders through a straight-line distance of 17 miles from its head near State Highway U-95 to Comb Wash. The upper forks of Fish Creek are narrow with a number of pour-offs and large boulders. At the junction of the forks of Fish Creek, the canyon cliffs are a sheer 700 feet high. A natural arch, rock pinnacles, and other sandstone forms enclose the meandering wash of Fish Creek. The canyon widens and becomes shallower as it approaches Comb Wash to the east.

Owl Creek Canyon begins near the unit's western border and enters Fish Creek Canyon near the middle of the WSA. The canyon averages 700 feet deep and meanders through a distance of about 7 straight-line miles. Numerous rock pinnacles, fins, knobs, and alcoves line the canyon walls. Nevill's Arch is an impressive, prominent feature in Owl Creek. Cottonwoods dot the wash bottom, and there is at least one year-round pool of water. Like Fish Creek, the upper forks of Owl Creek have formed rugged canyon bottoms with large boulders and pour-offs.

Information on the climate of the WSA is based on the nearest weather station at Natural Bridges National Monument, 10 miles away from Fish Creek. The average annual temperature is 51 degrees Farenheit (F), with an average low of 37 degrees F and an average high of 65 degrees F. The record low is -2 degrees F, and the record high is 101 degrees F.

Annual precipitation ranges from 8 to 12 inches over Fish Creek. January, May, and June are the driest months. July, August, and December are the wettest months. Rainfall is usually associated with thunderstorms that can be quite intense, producing flashflooding. Annual total snowfall ranges from 20 to 40 inches.

Specific Issues Identified in Scoping

General issues pertaining to more than Fish Creek Canyon WSA are discussed in Volume I. Issues and concerns raised in public scoping meetings (USDI, BLM, 1984) and specific to Fish Creek Canyon WSA are responded to below:

1. *Comment:* What would the effect of wilderness designation be on oil and gas development and oil and gas leases?

   Response: As discussed in the Mineral and Energy Resources sections of this document, existing oil and gas leases would continue to be managed under stipulations issued at time of leasing until their expiration dates. Leases would not be reissued after expiration unless a commercial oil and gas find has been made. The analysis assumes that such a find is unlikely and that existing leases would expire and no new leases would be issued.

STATEWIDE POCKET MAP
WSA NO. 48
SEE VOL. I

2. *Comment:* The WSA is a valuable wood-gathering area for neighboring Indian Tribes. Local officials have expressed concern over the amount of Federal land withdrawn from the full spectrum of multiple uses in the county and the impact of this on the availability of firewood.

Response: As discussed in the Forest Resources sections of the document, there are approximately 27,360 acres of pinyon-juniper woodland within the WSA. This is considered nonproductive forest land due to its low quality. Use of an estimated 4,275 cords of firewood available in the WSA would be foregone with designation. However, this is not considered a significant impact due to limited existing use in the WSA and the availability of these resources elsewhere in San Juan County.

3. *Comment:* There are portions of three cattle grazing allotments in the area. Wilderness designation would eliminate any possible range improvements.

Response: As discussed in the Livestock section of this document, the WSA contains portions of Comb Wash, Slickhorn, and Texas Muley Allotments. A proposed seeding of 2,100 acres would probably not be allowed if the area is designated wilderness. No other rangeland improvements are currently proposed. Some improvements (e.g., guzzlers or short fences) could be made if compatible with wilderness protection criteria.

4. *Comment:* Several miles of road run throughout this area which would be considered imprints. Several other roads are "cherry-stemmed." These should be recognized, and wilderness values lowered.

Response: Existing intrusions in the WSA are discussed in the Affected Environment, Wilderness Values section. There are approximately 19.8 miles of vehicular ways in the WSA. These, in addition to other intrusions, affect less than 1 percent of the acreage in the WSA. Overall, the 46,440-acre WSA is, therefore, considered to meet the naturalness standard for areas under wilderness review.

5. *Comment:* Sounds from State Highway U-95 can be heard in the WSA and would disrupt wilderness values.

Response: As discussed in the Affected Environment, Wilderness Values section, sights and sounds of traffic affect a user's sense of solitude for approximately 1 mile south of State Highway U-95.

6. *Comment:* The Dry Wash area offers exceptional opportunity to find a secluded spot because it is secluded and seldom visited; also, the Comb Wash road is seldom traveled.

Response: In the 1,500-acre area in question, the Comb Wash road, a barbed-wire fence, corral, and the unit's southern boundary road reduce the feeling of remoteness and seclusion creating less than outstanding opportunities for solitude.

7. *Comment:* The main reason for eliminating 11,220 acres as unsuitable seems to be the fact that "The WSA boundary on this portion followed legal subdivisions and was not identifiable on the ground." If this is a problem, then only BLM is to blame. Organic Act Directives 78-61, Change 3, restricts the use of legal subdivisions in drawing WSA boundaries to "special cases." A bit more than 3 miles of the boundary in question follows State land, but if the rest were a special case, it is hard to see why. Boundaries should follow ground features. They should be adjusted outward, in this case, to nearby roads.

Response: The land between the identified boundary and the road lacks outstanding wilderness values or contains noticeable intrusions. During scoping for this Environmental Impact Statement (EIS), BLM presented a preliminary indication of areas considered suitable or unsuitable for wilderness designation. For each WSA, this was based on site-specific analysis drafted in one of the five Utah BLM districts. The indication of suitability was made public prior to the EIS to obtain further input which has assisted in the formulation of the EIS alternatives. Additional input is expected as a result of the public review and comment on the Draft EIS. At the conclusion of the EIS process, BLM will review and consider all of the information received and at that time will formulate a final recommendation of areas found suitable for wilderness designation. Rationale for such recommendations will be included in a Wilderness Study Report to be submitted to the Secretary of the Interior and, subsequently, to Congress. The rationale will be keyed to the criteria of the "Wilderness Study Policy" (USDI, BLM, 1982a) and to other resource management factors generally as described in Chapter 2, Volume I of this EIS.

8. *Comment:* What would be the effect of wilderness management on the WSA's most prominent resources and uses including grazing, archaeology, and recreation?

Response: The effects of wilderness designation and nondesignation on these uses are addressed in this document. Overall, the effect of wilderness designation on livestock grazing would be negative due to preclusion of a 2,100-acre planned land treatment. The overall effect on cultural resources and recreation opportunities would be positive due to reduction in potential surface disturbance.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated from Detailed Study

No alternatives were identified for this WSA during scoping other than those analyzed.

Alternatives Analyzed

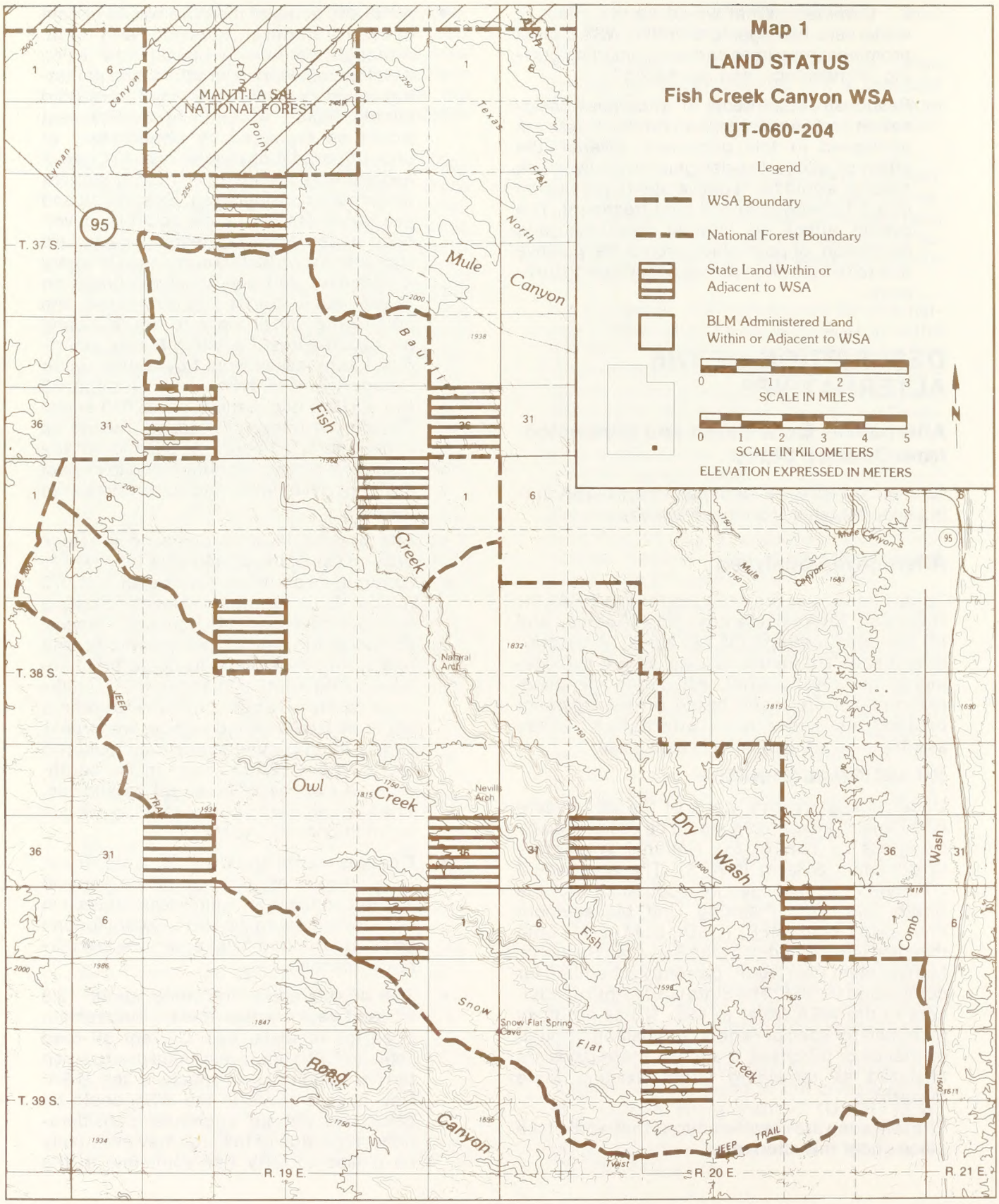
Three alternatives are analyzed for this WSA: (1) No Action; (2) All Wilderness (46,440 acres); and (3) Partial Wilderness (35,220 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 46,440-acre Fish Creek Canyon WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the South San Juan Planning Unit Management Framework Plan (MFP) (USDI, BLM, 1971) until that plan is superseded by the San Juan Resource Management Plan (RMP) currently scheduled for completion in 1986. The State land within or adjacent to the WSA (refer to Map 1) has not been identified for special Federal acquisition through exchange or purchase; therefore, these lands are analyzed as remaining under existing State ownership.

The following are specific actions that would take place under this alternative:

- All 46,440 acres of the WSA would remain open to mineral location and sale. Although no mining claims now exist, development work, extraction, and patenting would be allowed on any future valid mining claims. Any mining development would be regulated by unnecessary or undue degradation regulations (43 Code of Federal Regulations [CFR] 3809) without wilderness consideration. Existing oil and gas leases (44,399 acres) could be developed under leasing Category 1 (standard stipulations) on 32,500 acres and Category 2 (standard and special stipulations) on 11,899 acres. Under this alternative, the area would remain open to future leasing on 45,320 acres if existing leases expire. Any future leases would be issued under Category 2 on 19,310 acres and Category 3 (no surface occupancy) on 26,010 acres. Category 4 (closed to leasing) would be applied to 1,120 acres. Application of the restrictive categories is intended to protect aesthetic, watershed, and cultural values in the area.
- The present level of domestic livestock grazing use of the 46,440-acre WSA would continue as authorized in the MFP (1,073 Animal Unit Months [AUMs]). Existing livestock developments (four short fences, 350 acres of seeding, two reservoirs, and one spring development) could be maintained in a routine manner with vehicle access. New rangeland developments could be implemented without wilderness considerations. Vegetation treatments in four sections (2,100 acres) in the southwest part of the WSA would be allowed. The seeding would be expected to provide an additional 500 AUMs.
- Developments for wildlife, watershed, water resources, etc., would be allowed without concern for wilderness values if in conformance with the MFP. Except for one small pond, none exist and none are currently planned.
- The 46,440 acres, including about 19.8 miles of ways and jeep trails, would remain open for vehicular use. Current off-road vehicle (ORV) use is restricted due to steep terrain conditions in much of the WSA. New access roads in the WSA could be developed without wilderness considerations. A portion of the area may eventually be closed to ORV use sometime in the


Map 1
LAND STATUS
Fish Creek Canyon WSA
UT-060-204
Legend
WSA Boundary
National Forest Boundary
State Land Within or Adjacent to WSA
BLM Administered Land Within or Adjacent to WSA
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
MANTI-LA SAL NATIONAL FOREST
T. 37 S.
T. 38 S.
T. 39 S.
R. 19 E.
R. 20 E.
R. 21 E.
Mule Canyon
North Fish Creek
Fish Creek
Owl Creek
Dry Wash
Comb Wash
Snow Flat Spring Cave
Snow Flat Road
Canyon
JEEP TRAIL
Natural Arch
Nevills Arch
95

future, as recommended in the current MFP.

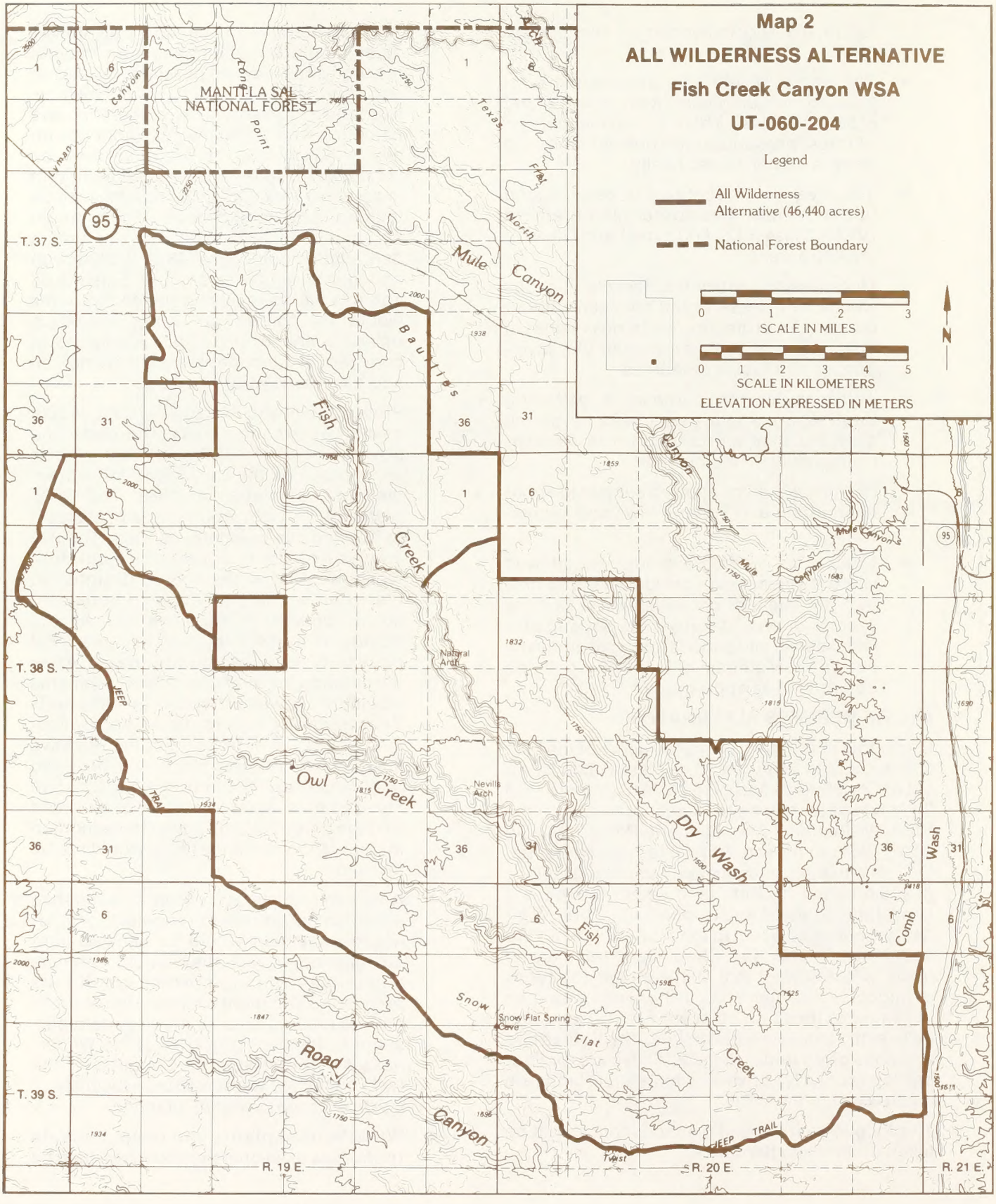
- The entire 46,440-acre area would continue to be potentially open to woodland product harvest. There is minimal harvest of forest products at the present time, and none is planned specifically.
- The area would continue to be managed under Visual Resource Management (VRM) Class II (28,000 acres) and Class III (18,440 acres).
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

ALL WILDERNESS ALTERNATIVE

Under this alternative, all 46,440 acres of the Fish Creek Canyon WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. On designation, acquisition of five sections (3,210.4 acres) of State land within the WSA is likely (refer to Map 1 and Appendix 3). Three of six State sections adjacent to the WSA likely would be acquired or exchanged. Should land transfers be made, it is assumed that management and types of impacts to former State in-holdings would be the same as those on adjacent Federal land and no specific analysis is given here. The figures and acreages given under this alternative are for Federal lands only. No private or split-estate lands are located within the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 46,440 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Although no mining claims now exist, development work, extraction, and patenting would be allowed to continue on any valid mining claims that may be located prior to wilderness designation. It is assumed that some such claims may be located. Any mining development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809) with concern for wilderness values. Existing oil and gas leases involving the 44,399 acres would be phased out upon expiration unless a find of oil or gas resources in commercial quantities is shown. No new oil and gas leases would be issued.
- Present domestic livestock grazing would be allowed to continue as authorized in the South San Juan MFP until that plan is superseded by the San Juan RMP scheduled for completion in 1986. The 1,073 AUMs in the WSA would remain available to livestock as presently allotted. The use and maintenance of rangeland developments existing at the time of designation (as listed in the No Action Alternative) could continue in the same manner and degree as in the past based on practical necessity and reasonableness. After designation, new rangeland developments would be allowed on a case-by-case basis if necessary for resource protection (rangeland and/or wilderness) and the effective management of these resources, provided that wilderness protection standards are met (refer to Appendix 1). It is assumed that the potential 2,100 acres of vegetation manipulation seedings likely would not be allowed.
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are presently planned.
- Wildlife transplants and developments (none now exist or are proposed) would be


Map 2
ALL WILDERNESS ALTERNATIVE
Fish Creek Canyon WSA
UT-060-204
Legend
All Wilderness Alternative (46,440 acres)
National Forest Boundary
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
MANTI-LA SAL NATIONAL FOREST
95
T. 37 S.
T. 38 S.
T. 39 S.
R. 19 E.
R. 20 E.
R. 21 E.
Mule Canyon
Fish Creek Canyon
Owl Creek
Dry Wash
Comb Wash
Snow Flat Road
Snow Flat Spring Cave
Natural Arch
Nevills Arch
JEEP TRAIL

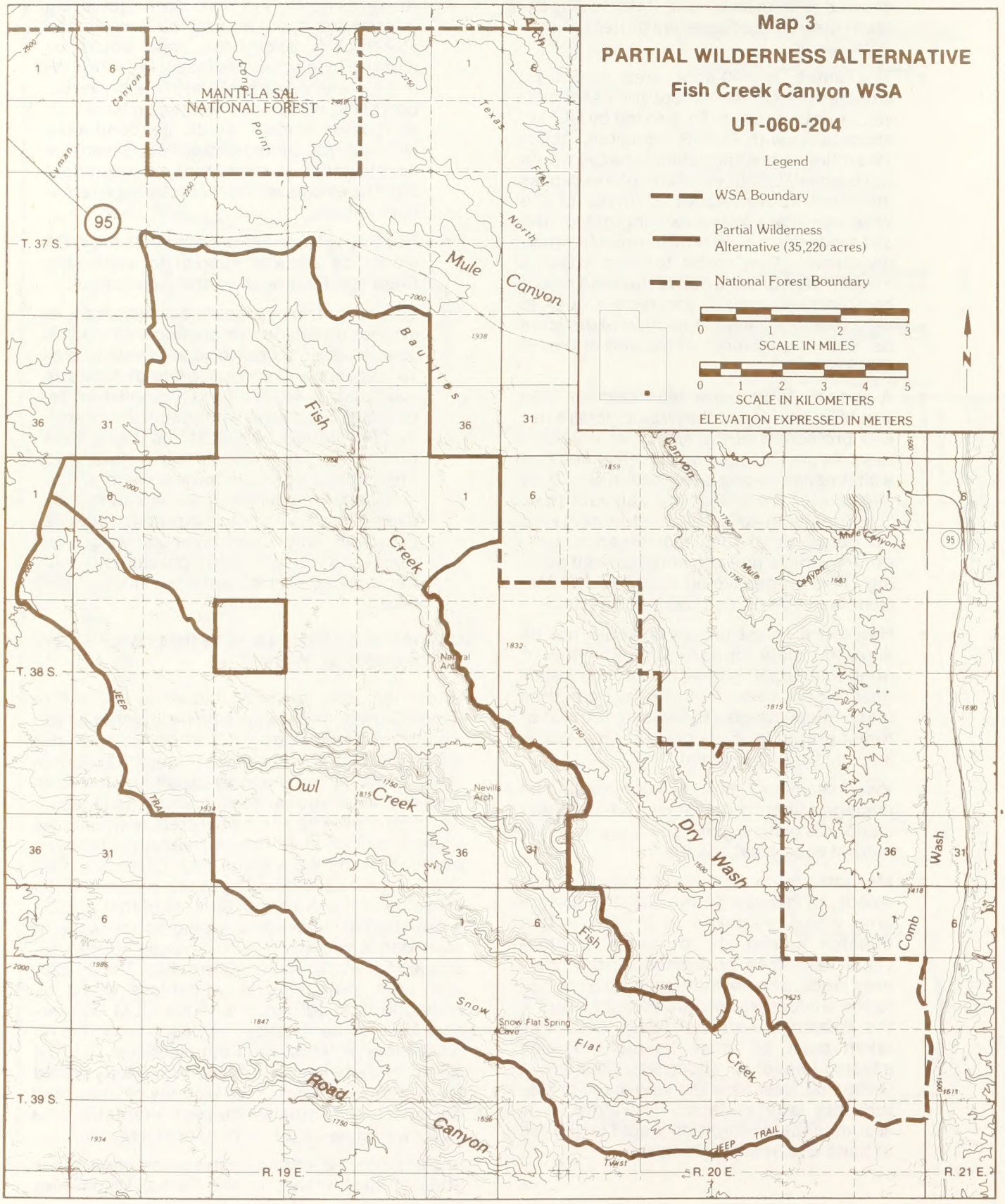
allowed as long as criteria (refer to Appendix 1) are met to adequately protect wilderness values.

- The entire 46,440-acre area would be closed to ORV use except for users with valid existing rights if approved by BLM in accordance with 43 CFR provisions. About 19.8 miles of existing vehicular ways would not be available for vehicular use except as indicated above. About 21 miles of the WSA boundary follow existing gravel and dirt roads that would remain open to vehicular travel. Two roads totaling about 5 miles in the northern half of the WSA would be "cherry-stemmed" and remain open to vehicle use. One State section also would be "cherry-stemmed" at the end of one of these roads.
- A specific Wilderness Management Plan would be developed that would govern use and protection of the 46,440-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed for roads that are adjacent to or "cherry-stemmed" into the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products at the present time, nor is any specifically planned.
- Visual resources on 46,440 acres would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease within the 46,440-acre area would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources in the 46,440-acre wilderness area would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Hunting without vehicle access in the WSA would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals, while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. A predator control program would be approved only upon clear showing that removal of the offending predators would not diminish the wilderness values of the area.

PARTIAL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under this alternative, 35,220 acres of the Fish Creek Canyon WSA would be designated as wilderness (refer to Map 3). The objective of this alternative is to analyze as wilderness that portion of the WSA having the most outstanding wilderness characteristics and to minimize manageability difficulties. The acres analyzed as wilderness under this alternative include the steepest canyon portions of the WSA along Fish Creek and Owl Creek. The 11,220-acre Dry Wash area along the east side of the WSA, but outside of that portion designated as wilderness, would be managed in accordance with the South San Juan MFP as described for the No Action Alternative. The 35,220-acre area designated as wilderness would be managed in accordance with the BLM "Wilderness Management Policy," as described in the All Wilderness Alternative. Four sections (2,570.4 acres) of State land within the WSA likely would be exchanged. Four of six sections of State land adjacent to the Partial Wilderness Alternative area likely would be acquired or exchanged.

Assumptions regarding analysis and impacts for State lands involved in the Partial Wilderness


Map 3
PARTIAL WILDERNESS ALTERNATIVE
Fish Creek Canyon WSA
UT-060-204
Legend
WSA Boundary
Partial Wilderness Alternative (35,220 acres)
National Forest Boundary
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
MANTI-LA SAL NATIONAL FOREST
T. 37 S.
T. 38 S.
T. 39 S.
R. 19 E.
R. 20 E.
R. 21 E.
Mule Canyon
Fish Creek Canyon
Owl Creek
Dry Wash
Fish Creek Canyon
Snow Flat Spring
Jeep Trail
Neville's Arch
95

Alternative are the same as described for the All Wilderness Alternative. The figures and acreages under this alternative are for Federal lands only.

A summary of specific actions follows:

- The 35,220-acre wilderness would be withdrawn from mineral entry and closed to new mineral leasing and sale. In the 35,220-acre area, development work, extraction, and patenting would be allowed to continue on any valid claims located prior to wilderness designation (none exist at the present time). The existing oil and gas leases, covering 33,379 acres, would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown. The 11,220-acre area (refer to Map 3) within the WSA not designated wilderness would be open to future mineral location, leasing, and sale. In the 11,220-acre area development work, extraction, and patenting of future mining claims could occur without wilderness consideration if claims are valid. The area not designated would be managed as oil and gas leasing Category 2 (standard and special stipulations) on 2,030 acres, Category 3 (no surface occupancy) on 8,300 acres, and Category 4 (closed to leasing) on 890 acres.
- Domestic livestock grazing would continue to occur in the 35,220-acre wilderness area. The 750 AUMs in the 35,220-acre area would remain available to livestock as presently allotted. Existing range projects (four short fences and one reservoir) could be maintained based on practical necessity and reasonableness. New rangeland facilities could be allowed in the wilderness area if necessary for protection and management of the rangeland and/or wilderness resource, provided that wilderness protection standards are met (refer to Appendix 1). It is assumed that the planned seeding of 2,100 acres in the wilderness area likely would not be allowed. In the 11,220-acre nonwilderness area, grazing use of 323 AUMs would be continued. Existing developments (one reservoir and one spring project) could be maintained in a routine manner with vehicle access. New rangeland developments could be allowed in this area (none are currently planned) without concern for wilderness values.
- In the 35,220-acre wilderness, new water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed only if enhancing to wilderness, if necessary to correct conditions that are imminently hazardous to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act*. In the remaining 11,220-acre area, developments of water resource facilities would be allowed without concern for wilderness values if in accordance with the MFP. None are now proposed.
- In the 35,220-acre wilderness, wildlife transplants or habitat improvements would be allowed only if they are compatible with wilderness values. In the remaining 11,220-acre area, wildlife transplants or improvements would be allowed without concern for wilderness values. None are now proposed in either part of the WSA.
- The canyons and associated areas that would comprise the 35,220-acre wilderness would be closed to ORV use. About 6.8 miles of existing ways would not be available for vehicular use except in situations described under the All Wilderness Alternative. The remainder of the unit, including the existing 13 miles of ways in the southeast part of the WSA, as well as the roads bordering the WSA would remain open to vehicular travel. One road about 3 miles long would be "cherry-stemmed" on the west side of the WSA and would remain open to vehicular use. A State section at the end of this road also would be "cherry-stemmed."
- A specific Wilderness Management Plan would be developed to govern use and protection of the 35,220-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products in the 35,220-acre wilderness would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. The remaining 11,220 acres would be open to commercial woodland harvest, although none is planned.

- Visual resources in the 35,220-acre wilderness would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change. The remaining 11,220 acres would be managed as VRM Class II (8,860 acres) and Class III (2,360 acres).
- Within the 35,220-acre wilderness area, measures to control fire, insects, noxious weeds, or disease would be taken only in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques. In the 11,220-acre nonwilderness area, measures of control would be taken without wilderness considerations.
- In the nonwilderness area, any activity for the purpose of gathering information about natural resources would be allowed by permit. In the 35,220-acre wilderness, such activity would be allowed by permit provided it was accomplished in a manner compatible with wilderness preservation. Information gathering would be limited to that conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- In the 11,220-acre area, hunting would be allowed subject to applicable State and Federal laws and regulations. In the 35,220-acre wilderness, hunting would be allowed subject to applicable laws and regulations, but use would be limited to nonmotorized means.
- In the nonwilderness area, control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious loss of domestic livestock. In the 35,220-acre wilderness, control of predators would be allowed to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, but only under conditions that would ensure minimum disturbance to wilderness values. Poison baits or cyanide guns would not be allowed.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to provide a comparison of the alternatives.

AFFECTED ENVIRONMENT

Air Quality

The closest air monitoring station to the WSA is 50 miles west at Bullfrog Marina on Lake Powell, where particulate and sulfur dioxide concentrations are measured.

Only the short-term (24-hour) particulate standard has been exceeded at the Bullfrog station. These 24-hour violations were probably associated with conditions of high winds and blowing dust (resulting from the scarce vegetation and large areas of exposed sand). Sulfur dioxide concentrations measured at Bullfrog Marina are low and well under the applicable ambient standards.

Generally the air quality is very good over the WSA, allowing for long vistas where topography and vegetation do not obstruct sightlines. Visual range in the general vicinity of the Fish Creek Canyon WSA averages between 100 and 132 miles during the summer (Aerocomp, Inc., 1984).

The WSA is in a Prevention of Significant Deterioration (PSD) Class II area under the provisions of the Clean Air Act as amended. This classification allows for moderate increases in air pollution levels.

Geology

The WSA is within the Canyonlands Section of the Colorado Plateau Physiographic Province. This is the province section that is most rugged and least accessible. The many canyons are precipitous; escarpments separate dry plateaus, and erosion has produced picturesque buttes, arches, and natural bridges.

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
FISH CREEK CANYON WSA

Resource	Alternatives		
	No Action	All Wilderness (46,440 Acres)	Partial Wilderness Designation (35,220 Acres) (Proposed Action)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil and 18 billion cubic feet of natural gas.	Oil and gas likely would not be recovered but, due to the low likelihood of recovery, the loss of development opportunity would not be significant.	Although likelihood is low, up to 1 million barrels of oil and 14 billion cubic feet of natural gas could be recovered.
Wildlife	About 0.3 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat. Wildlife would benefit in the long term from the proposed land treatment on 4.5 percent of the WSA.	Wildlife would benefit from solitude. The proposed land treatment would not be allowed, and benefits to wildlife would not occur.	Effects in the designated portion would be the same as for the All Wilderness Alternative. About 0.3 percent of the nondesignated portion could be disturbed by mineral and energy development, which could adversely affect wildlife habitat.
Livestock	Grazing of 1,073 AUMs and maintenance of existing developments would continue. A proposed 2,100-acre land treatment could be implemented.	Grazing of 1,073 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. Proposed new developments might not be allowed.	Effects would be about the same as for the All Wilderness Alternative.
Visual Resources	The quality of visual resources could be impaired on up to 2,260 acres.	Visual quality would not be impaired, as mineral-related activities and land treatments would not occur.	Visual quality could be impaired on up to 38 acres in the nondesignated portion. About 68 percent of the Class A scenery would be within the designated portion and would be protected by the reduced potential for disturbance.
Recreation	ORV use would continue on 19.8 miles of ways at current low levels. Overall recreational use could increase from the present 4,165 visitor days per year to 6,206 over the next 20 years. Up to 160 acres of mineral-related disturbance and 2,100 acres of land treatment could reduce the quality of primitive recreation.	The WSA, including 19.8 miles of ways, would be closed to ORV use. Recreational use could increase to up to 9,288 visitor days over the next 20 years due to publicity associated with wilderness designation.	ORV recreational use could continue on 13 miles of ways in the nondesignated portion. Overall recreational use could increase to up to 7,044 visitor days over the next 20 years.

TABLE 1 (CONTINUED)
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
FISH CREEK CANYON WSA

Resource	Alternatives		
	No Action	All Wilderness (46,440 Acres)	Partial Wilderness Designation (35,220 Acres) (Proposed Action)
Wilderness Values	Wilderness values could be lost on up to 2,260 acres (4.9 percent of the WSA).	Wilderness values would be protected, as the WSA would not be affected by mineral-related disturbance or land treatments.	Wilderness values would be protected in the designated area. Impairment could occur on 0.3 percent of the 11,220 acres not designated. Overall, wilderness values could be lost on 0.08 percent of the WSA. However, 76 percent of the area meeting the standards for naturalness and outstanding opportunities for primitive recreation and 78 percent of the area meeting the standards for outstanding opportunities for solitude would be in the designated portion and would be protected by reduced potential for disturbance.
Land Use Plans and Controls	This alternative would be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the current BLM South San Juan MFP.	This alternative would not be consistent with San Juan County's concept of multiple use. It would be consistent with State policy if lands were exchanged. Designation would constitute an amendment of the BLM South San Juan MFP.	Partial designation would be the same as the All Wilderness Alternative, except that the portion not designated would be consistent with San Juan County policy.
Socio-economics	Annual local sales of less than $38,537 and Federal revenues of up to $135,702 would continue. Additional forage from land treatment might increase local livestock sales by up to $10,000 and Federal grazing revenues by $700.	Annual local sales of less than $38,537 and Federal revenues of up to $1,502 would continue, but Federal revenues of $133,200 from mineral leasing and local benefits and Federal receipts from additional grazing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA, but increased recreational use over the next 20 years might result in local benefits of up to $38,081.	The effects of this alternative would be the same as for the All Wilderness Alternative, except that annual Federal revenues would be reduced by up to $101,337. Local sales from recreational benefits up to $28,800 might result from increased recreational use over the next 20 years.

The geology of Fish Creek is quite simple from the standpoint of the number of exposed geologic formations. All of Fish Creek has been cut into the Cedar Mesa Sandstone Member of the Cutler Formation of Permian Age (225 to 280 million years ago). The thick sandstone forms the broad surface of Cedar Mesa, covering about 350,000 acres north of the San Juan River. The WSA sits adjacent to the crest of a broad uplifted area known as the Monument Upwarp, which has a north-south axis and extends east to west from Comb Ridge to Clay Hills.

The Cedar Mesa Sandstone appears to be essentially horizontal, but it does dip gently to the south and east at 13 degrees. In most places throughout Fish Creek, the stream has probably cut almost through the Cedar Mesa Sandstone. The present gradient of the stream is very close to the south and west dip of the sandstone.

The WSA's topography can be divided into three categories: mesa tops, canyons, and sloping, broken valleys.

The mesa tops generally dip to the south and east with an elevation of 6,800 feet in the northwest corner of the WSA falling to 5,300 feet over a distance of about 12 miles. Hills and ridges on the mesas range up to several hundred feet, providing topographic relief.

Fish, Owl, McCloyds, and Dry Wash Canyons are deeply entrenched into the mesa as they meander southeasterly toward the Comb Ridge. They vary in depth from 50 feet at the heads to over 700 feet where they cut through the edge of the mesa. The erosion of the canyon has left a multitude of pinnacles and buttes standing apart from the canyon's walls. Several arches have been formed in the area, the largest being a flying buttress arch in Owl Canyon called Nevill's Arch. The rims of these canyons provide great vantage points to view the unique points of interest. The sandstone has eroded in such a manner that caves and overhangs provide sheltered areas where Anasazi culture habitations are found.

The canyons are accessible from the mesa top in only a few spots conducive to backpacking. Talus slopes reach from the bottom of the canyons to the top of the rims in Fish and Owl Canyons. Small pour-offs must be circumvented in both of these canyons.

The valley portion (Comb Wash) also dips to the southeast and ranges in elevation from 5,100 feet to 4,600 feet. Hills and ridges (generally less than 100 feet) break up this section and provide some topographic relief.

Soils

Soil characteristics are shown in Table 2. The soil cover of the WSA can be divided into 50 percent Rock Land soil association and 50 percent Aridic Argiustoll-Typic Argiustolls soil association.

The Rock Land type is made up of from 50- to 75-percent bare rock, from 20- to 40-percent shallow and very shallow (less than 10 inches) soils, and from 5-to 10-percent moderately deep (20 to 36 inches) soils. The bare rock occurs as the sandstone cliffs, ledges, slickrock, and monoliths characteristic of the canyonlands of southeast Utah. The soils present are light to dark reddish-brown and range in texture from accumulations of wind-deposited sand to very fine sandy loam. Precipitation runoff is high from this land type and erosion causes the poorly developed soils.

TABLE 2

Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year)	
			Present Condition	Bare Soil Surface
Rock Outcrop	15	6,966	0	0
Shallow loamy soils on sloping structural benches	45	20,898	1	5
Deep loamy soils on gently sloping structural benches and along drainages	20	9,288	0.1	1
Deep stony soils on steep canyon sides	20	9,288	1	10
Totals	100	46,440		

Source: Hansen, 1985.

In the Argiustolls soil association, 40 percent of the surface is classed Aridic, 35 percent is Typic, and 25 percent is Lithic with some rock outcrop. Aridic Argiustolls are deep (more than 36 inches) with well developed subsoils and substrata. Typic Argiustolls are moderately deep (20 to 36 inches) and have less well developed subsoils and substrata. Lithic Argiustolls are shallow (10 to 20 inches), often flaggy near the surface, and are underlain by sandstone bedrock at less than 20 inches. All of the soils in this group are medium to dark reddish-brown in color and of moderate alkalinity. Soil textures range from very fine sandy loam to fine silty material.

Runoff in the WSA is medium to rapid, and the estimated average soil loss rates are shown in Table 3.

Vegetation

The vegetation in the WSA is classified as either pinyon-juniper, sagebrush, or desert shrub type (refer to Table 4). Additional land is classified as slickrock without substantial vegetation. There are approximately 12 acres of riparian vegetation in the WSA.

TABLE 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions			Annual Soil Loss if Disturbed		
		Percent of Area	Acres	Cubic Yards	Percent of Area	Acres	Cubic Yards
Very High	20	0	0	0	0	0	0
High	10	0	0	0	20	9,288	92,880
Medium	5	0	0	0	45	20,898	104,490
Low	1	65	30,186	30,186	20	9,288	9,280
Very Low	0.1	20	9,288	928	0	0	0
None	0	15	6,966	0	15	6,966	0
Totals	—	100	46,440	31,114[1]	100	46,440	206,650[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.66 under present conditions; 4.45 if disturbed.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Pinyon-juniper	27,360	59
Sagebrush	1,620	03
Desert shrub	13,000	28
Barren	4,460	10
Totals	46,440	100

Source: USDI, BLM, 1971.

A portion of Section 35, Township 37 South, Range 19 East, and Section 1, Township 38 South, Range 20 East, was railed and reseeded in 1955. This area has now returned to a sagebrush-type vegetation and is included in this category.

There are no threatened or endangered plant species in the WSA. Four species (*Astragalus cottamii, Astragalus monumentalis, Erigeron kachinenis, Zigadenus vaginatus*) that may occur within the WSA are candidate species under review by the Fish and Wildlife Service (FWS) for possible threatened or endangered status.

The Fish Creek Canyon WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) types in the WSA are listed on Table 5. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 5
Potential Natural Vegetation Types

PNV Type	Acres	Percent of WSA
Blackbrush	14,559	31
Juniper-pinyon woodland	31,881	69
Totals	46,440	100

Source: USDI, Geological Survey, 1978.

Water Resources

In portions of Fish Creek there is flowing water (about 5 miles) that supports nongame fish species and amphibians. Cattle utilize lower Fish Creek during the grazing season.

There are 10 springs along the length of Fish and Owl Creeks. The water quality is generally good and these creeks are used by recreationists and wildlife.

No water wells occur within the WSA. There are two stock reservoirs and a developed spring.

Mineral and Energy Resources

The BLM, in consultation with the U.S. Department of Energy, had each WSA within Utah independently assessed for its energy and mineral resource values by Science Applications, Inc. (SAI, 1982). The energy and mineral resource rating is given in Table 6. Refer to Appendix 5 for a detailed description of the SAI rating system.

The potential for mineral resources in this WSA is low due to a marginally favorable geologic environment. An overall importance rating (OIR) of 2

TABLE 6

Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f2	c2	Less than 10 million barrels of oil; less than 60 billion cubic feet of gas
Copper	f1	c1	None
Uranium/Vanadium	f1	c1	None
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f1	c4	None
Manganese	f1	c1	None
Potash	f1	c3	None

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).

[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

was assigned to the Fish Creek Canyon WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report for the WSA. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. There are no minerals currently listed as strategic and critical found within the WSA (Federal Emergency Management Agency, 1983).

The mineral resource potential of the WSA is rated from none to low. Spectrographic analyses of stream sediments and rocks collected in the area by the USDI, Geological Survey and Bureau of Mines do not suggest derivation from mineralized terrains. Scintillometer traverses along the principal roads and trails detected no anomalous radioactivity. Triassic rocks, which are hosts for uranium and copper deposits in adjacent areas, are not present in this area. Traces of gold were detected in panned concentrates of stream sediments but the reported values are too low to encourage prospecting. Sand and gravel in Quaternary deposits and limestone in formations of Pennsylvanian and Permian Age in the area are of little potential value because of their remote location and the presence of readily accessible adequate supplies of these materials elsewhere in the region.

LEASABLE MINERALS

Due to unfavorable geologic conditions, it has been determined that no coal, potash, geothermal, or other leasable resources, with the possible exception of oil or gas, are present in this WSA. Also, no leases for these resources exist in the WSA.

Oil and Gas

The oil and gas potential is low. Although the WSA and adjacent lands have no record of production, shows of oil and gas in some wells suggest the possibility that oil and gas may be present in Permian, Pennsylvanian, Mississippian, and Devonian rocks. The area probably lies outside the saline facies of the Hermosa Formation (Pennsylvanian) that contains the major oil fields in the Four Corners region. Morever, much of the Hermosa Formation, correlative with productive zones, is breached by the San Juan River near the WSA so that oil formerly present may have drained away. Nevertheless, structural and stratigraphic traps in the Pennsylvanian rocks may be sealed by impermeable facies from reservoir drainage into the canyon of the San Juan River. The records show four oil and gas wells have been drilled in the area, and 57 near the area. Shows of oil and gas were encountered in Permian, Pennsylvanian, Mississippian, and Devonian strata. However, none of these wells were productive, and all of the wells were plugged and abandoned. Two wells were drilled into the Paradox Formation in 1982. Both of these recent wells were dry holes and they have been plugged and abandoned. The low oil and gas rating indicates a potential for accumulations of less than 10 million barrels of oil, or if gas, less than 60 billion cubic

feet (in-place), with less than 3 million barrels of oil and less than 18 billion cubic feet of gas considered potentially recoverable.

Oil and gas lease categories were established for the area in 1975. The WSA includes three leasing categories: Category 2 (standard and special stipulations) on 19,310 acres (42 percent of the WSA); Category 3 (no surface occupancy) on 26,010 acres (56 percent of the WSA); and Category 4 (closed to leasing) on 1,120 acres (2 percent of the WSA). These categories were established for protection of the aesthetic, watershed, and cultural values of the area.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

The WSA has 37 existing leases covering approximately 44,399 acres. Of these, 28 are pre-FLPMA that were issued before the lease categories were established. Nine post-FLPMA leases (11,899 acres) have been issued within the WSA and 2,041 acres of the WSA are unleased. Of the unleased acres 921 are open to future leasing.

LOCATABLE MINERALS

The WSA does not lie within an organized mining district. No mining claims are known to have been located within the WSA. Due to geologic unfavorability, no known or projected deposits of minerals are located in the WSA.

Wildlife

Animals common in pinyon-juniper woodland communities are found throughout the WSA. The canyons provide intermittent riparian habitat for a diversity of wildlife species.

There are a few resident mule deer, but most deer utilize the area only during the winter. The WSA is within the White Canyon-Red Canyon Desert Bighorn Sheep Habitat Management Area. There have been no documented sightings of desert bighorn sheep in this area in over 5 years. Due to bighorn sheep petroglyphs, the area is considered historical habitat (no crucial acres). Bighorn sheep poplulations are not expected to be reestablished in the WSA at this time, and no future transplants or habitat improvements have been planned.

Spotted skunk and ringtail cat are found in the canyons, but they are rarely observed due to their nocturnal habits. Mountain lion and bobcat inhabit the remote canyons. Coyote, cottontail rabbit, white-tail antelope squirrel, Ord kangaroo rat, pinyon mice, whitethroat woodrat, and assorted bats are found unit wide. A few beaver utilize the riparian areas of the WSA.

There is very little waterfowl habitat within the WSA. Mourning dove is the only gamebird that nests in the area. Chukar, a gamebird introduced from Asia, may occasionally be found along the eastern edge of the WSA. Hairy woodpecker, violet-green swallow, pinyon jay, titmice, and rock wren are common in these pinyon-juniper environments. The greatest diversity of nongame birds is found in the canyons during the spring migration. Red-tailed hawk, American kestrel, and great horned owl are found throughout the area.

The most common reptile and amphibian species found within the WSA are the Great Basin spadefoot toad, red-spotted toad, sideblotched lizard, northern plateau lizard, orange-headed spiny lizard, Great Basin gopher snake and Hopi rattlesnake. Canyon tree frogs, leopard frogs, and black-necked garter snakes can be found in the wetter areas.

Southwest plains killifish, speckled dace, fathead minnow, bluehead sucker, and sand shiner are found in Fish Creek and Comb Wash.

Bald eagles are winter transients in the area; however, no roosting sites have been located. The FWS has not identified any threatened or endangered species in this WSA. No critical habitats have been identified nor are there existing or

planned wildlife management facilities or treatments in the WSA. No other sensitive species are known to occur in the WSA.

Forest Resources

There are 27,360 acres of pinyon-juniper woodland within the Fish Creek WSA. These are low quality sites (less than 20 cubic feet usable wood per acre) and are considered nonproductive forest land. Less than an estimated 4,275 cords of firewood exist in the WSA. At the present time, pulp and papermaking opportunities are low. No areas in or near the WSA have been designated as Christmas tree cutting areas and limited potential exists for Christmas tree harvesting.

During 1981, 26 permits were sold to cut a total of 1,700 juniper posts in the Cedar Mesa area. It is not known how many, if any, were taken from the WSA. Firewood is gathered along the western boundary of the WSA from State Highway U-95 to Snow Flat. Pine nuts are gathered by a few individuals, but there have been no commercial gathering permits issued in this WSA.

Livestock and Wild Horses/Burros

The WSA contains portions of three allotments: Comb Wash, Slickhorn, and Texas Muley, as shown in Table 7. Within the WSA there are an estimated 172 AUMs in the Slickhorn Allotment, 153 AUMs in the Texas Muley Allotment, and 748 AUMs in the Comb Wash Allotment. This totals 1,073 AUMs in the WSA.

TABLE 7
Livestock Grazing Use Data

	Allotments			
	Slickhorn	Texas Muley	Comb Wash	Total
Class and Number of Livestock	219 Cattle	274 Cattle	528 Cattle	1,021 Cattle
Number of Operators	1	1	13	15
Season of Use	10/6 to 6/15	11/5 to 5/31	10/6 to 5/31	
Total AUMs	1,795	1,795	3,961	7,551
AUMs in WSA	172	153	748	1,073
Total Acres	143,624	75,617	72,132	291,373
Acres in WSA	22,220	9,510	14,710	46,440
Percent of Allotment in WSA	16	14	22	16

Source: USDI, BLM, 1971.

Existing improvements for livestock use located within the WSA include: two fences, two seedings (totaling 350 acres), two reservoirs, and a spring. The only proposed rangeland development is a vegetation treatment and seeding of 2,100 acres (Township 39 South, Range 19 East, Sections 2, 3, 11, 12) that would provide an additional 500 AUMs.

Some vehicular use of existing ways for livestock management may occur.

There is no agricultural activity within the WSA. There is dry farming on land about 3 miles to the west of the WSA. Those areas in the WSA, with deeper soils, have potential for agricultural activity.

There are no wild horses or burros in this WSA.

Visual Resources

The Fish Creek Canyon WSA has been given VRM Class II (28,000 acres) and Class III (18,440 acres) management recommendations. The Class II area corresponds with the canyon systems and the Class III with the mesa tops. These classes are developed by combining scenic quality, distance zones, and sensitivity levels. The canyons have a Class A scenic quality (28,000 acres) while the mesas are mostly Class B (18,440 acres). The area adjacent to Highway U-261 is in the foreground, the mesa comprises the background, and the canyons are within the seldom-seen zone. Likewise the area adjacent to Highway U-261 has a high sensitivity, as do most of the mesas, while the canyons have a medium sensitivity. The Dry Wash area is rated as having a low sensitivity.

The canyons have been cut through Cedar Mesa Sandstone, forming a meandering pattern of steep-walled sides up to 800 feet deep. The major texture is the smooth slickrock while rough talus slopes of jumbled rock do occur. Arches, pinnacles, and rincons provide additional visual variety to this landform. Colors vary in intensity with the location of the sun, but are generally shades of reds, browns, and grays. The mesa type consists of flat to rolling sandstone outcrops and soil areas. Texture is generally smooth with colors ranging from dark browns and reds to light tans.

The vegetation varies with the landform. The canyons contain a desert type with sage, cactus, and annuals present. Adjacent to the drainage bottom, a riparian habitat exists containing cottonwoods and willows. The dominant vegetation type of the mesa is the pinyon-juniper woodland.

The color of the vegetation varies from light gray-green to dark or bright greens. These colors create a contrast with earth tones of the landform.

The interaction of the contrasting colors of the landforms and vegetation types with visual variety of the landform shapes creates an outstanding scenic environment. Refer to Appendix 7 for a description of BLM's VRM system.

Cultural Resources

Archaeological work was conducted on Cedar Mesa as early as the 1890s; however, most of this work was done in the vicinity of Grand Gulch. The inventory work in the WSA is related to small project clearances and recording of the major cliff dwellings in the canyons. The work on Cedar Mesa helped to define the broad cultural periods recognized for the region today (refer to Volume I).

The WSA contains a wealth of pristine cultural resources. A literature search revealed 40 recorded sites representing primarily the Anasazi culture. Most of the sites consist of habitation camps or cliff dwellings, storage cists, and/or storage structures (granaries).

There are no existing National Register sites and/or nominations in this WSA. However, based on estimates from similar settings in the area, it could be expected that 5,445 sites would be located in the WSA, of which 3,630 could be National Register eligible.

Portions of the west and south boundaries are along the Hole-in-the-Rock Trail, which is a National Register site. This trail was used by Mormon pioneers in 1879 to 1880 to travel from Escalante, Utah to settle the Bluff, Utah area.

Recreation

Fish, Owl and McCloyd's Canyons are very popular backpacking and dayhiking areas. People who are looking for a 3- to 5-day loop trip often choose Fish and Owl Creeks. Also, all three canyons have intermittent running water throughout the drainages, which make them very attractive during the warmer months.

Visitors to this area are asked to register at Kane Gulch Ranger Station, but it is not mandatory. Many groups go straight to the trailheads without registering. Statistics from 1980 to 1984 indicate an overall increase of visitor use in the Fish Creek Canyon WSA. Annual visitation for that period is as follows: 1980, 2,469; 1981, 3,910; 1982, 4,278; 1983, 3,757; and 1984, 6,163. The data include commercial and educational use. Two commercial tour companies use the WSA. Also, the use has especially increased with educational groups.

The WSA is in the Utah Division of Wildlife Resources' (UDWR) Deer Herd Unit 31B. This herd unit has been closed to hunting during the past few seasons. Prior to 1980 there were few deer hunters in the area.

Access into the canyons is considered difficult as no trails are developed to guide one through the steep, rugged descents. In the canyon bottoms, trails (developed by use) are evident, especially through the vegetated areas.

A limited amount of motorized (dirt bike) recreation use (about 30 annual visitor days) occurs in the lower portion of Fish Creek (to about the junction with McCloyd's Canyon). Nonmotorized recreational users of the area have complained to the Grand Gulch Rangers about this use. Vehicular use of existing ways (about 20 annual visitor days) also occurs on the mesa top for sightseeing purposes, largely to the Fish Creek overlook.

The total average annual recreation use is estimated at about 4,165 visitor days. About 1,000 of these visitor days are as a result of commercial recreation services using the WSA.

Wilderness Values

SIZE

The Fish Creek Canyon WSA contains 46,440 acres of public land.

NATURALNESS

The major imprints surrounding Fish Creek WSA were eliminated by boundary adjustments during the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980). What remains are seldom traveled ways, a few livestock developments, and four abandoned drill holes.

There are approximately 19.8 miles of ways inside the WSA and 2.2 miles of access to a drill hole reclaimed under BLM's *Interim Management Policy* (USDI, BLM, 1979) constraints.

From the northeast side of the unit a way extends 5.9 miles south in the WSA. This way travels along a narrow mesa top, ending in a grassy area near the mesa point between Fish Creek and Dry Wash Canyons. Vehicle passage has created this way which winds among the pinyon-juniper, crosses grassy glades, and follows wash bottoms in a few

places, especially towards its end on the mesa point. From the above-mentioned way, three spur ways fork to the west.

The first one follows the unit boundary for a total of about 1.50 miles. The two-wheel tracks have been formed by the passage of vehicles. The way weaves among the pinyon-juniper trees and across the sage flats and is well revegetated with grasses and encroaching bushes. Another way extends west for 0.8 mile through sage finally disappearing into a sage flat. Vehicle passage has created a third way to the west for 1.0 mile to the rim of Fish Creek Canyon. As with the others, it crosses sage flats, weaves among the pinyon-juniper, and crosses slickrock.

An access way and drill pad were built in December 1981 from the Comb Wash Road (drill pad in Township 39 South, Range 20 East, Section 11). Part of an existing way was accessed by a newly constructed route that totaled 2.2 miles. The newly constructed way and drill pad were reclaimed in 1982.

From the Comb Wash road, a way protrudes into the unit for 3.1 miles to an abandoned drill hole in Section 10, Township 39 South, Range 20 East. At one time this way was constructed; however, it is severely washed out where it crosses Fish Creek, and erosion is occurring in a few places. Beyond the drill pad, vehicle tracks extend around a small knoll for approximately 0.5 mile.

An old way extends up Fish Creek Wash for approximately 4 miles. Where this way crosses the creek bed it has become overgrown, washed out, and difficult to find.

From the "cherry-stemmed" road to Snow Flat Spring Cave, a way continues for 1.4 miles to the rim of McCloyd Canyon (a tributary of Owl Creek Canyon). The passage of vehicles has created this way, crossing sage flats and weaving among pinyon-juniper trees. Also from the Snow Flat Road a way crosses sage flats in State Section 2, ending at the rim of McCloyd Canyon for a total of 1.1 miles. This way similarly was created by the passage of vehicles and winds among pinyon-juniper trees and sage flats.

Vehicle tracks on the cryptogamic soils weaving approximately 0.3 mile among the moderately dense pinyon-juniper enter the unit from State Section 32 on the unit's southwest. These tracks follow the north rim of a shallow canyon.

A railing and reseeding project (the East Slickhorn Reseeding) was completed in 1955 on the unit's northeast boundary. On 1,462 acres, the sagebrush was railed and the area seeded with crested wheatgrass. Only a small portion is mapped as being within the WSA. There are large grassy fields along the Dry Wash Road (outside the unit) but in the portion inside the unit, thick 3-foot-tall sage is predominant; therefore, the project is thus not apparent within the WSA.

An old and deteriorated corral, possibly with historical value, is in a sage flat in Township 38 South, Range 19 East, Section 12. It is built with upright pinyon or juniper poles. The overall influence on the WSA's naturalness is negligible.

An archaeological site that has been fenced and stabilized is on the rim of Dry Wash Canyon on or just inside the WSA boundary. Referred to as Comb Wash Overlook, these are well preserved ruins with a dramatic view of the junction of Dry and Comb Washes.

Two stock reservoirs are located in the southeast part of the WSA, but neither is a substantial intrusion. In the southeast part of Fish Creek Canyon WSA there are four abandoned and reclaimed drill holes.

At Snow Flat Spring Cave there are two natural springs. One, inside a cave, has had two wooden troughs placed under the dripping water. A metal sign bearing the words Snow Flat Spring Cave has been placed here, just west of the springs.

There is a 25-foot-wide seismic line running straight north from the "cherry-stemmed" road to the drill hole in the west portion of the WSA. It is an imprint within the WSA for 0.5 mile and is substantially noticeable. A minor boundary adjustment could be made to remove this imprint from the WSA.

These imprints affect less than 1 percent of the WSA. The 46,440 acres would be considered natural and meet the naturalness standards for areas under wilderness review.

SOLITUDE

The WSA offers outstanding opportunities for solitude. The desert canyon system, including four deep canyons and their forks, offers miles of opportunities for users to experience seclusion and isolation. The canyons are still and quiet. The meanders and 700-foot cliffs effectively block lines of sight and muffle sounds for any substantial distance.

On the mesas the thick pinyon-juniper vegetation effectively screens visitors and enhances the ability to feel secluded in the natural world. From high points, one views a sea of pinyon-juniper cut by

abrupt canyons. To the south, the cultivated fields on Brushy Flat can be seen, and to the north, road cuts of the new Highway U-95 are barely visible. For approximately 1 mile south of Highway U-95, sights and sounds of traffic affect a user's sense of solitude. Dropping into a gulch or canyon, a user can avoid these highway sounds. In the WSA's extreme southeast the Class B County road down Comb Wash impacts upon a user's sense of solitude. The area approximately 1 mile west of the road is relatively open, covered mainly by greasewood. In this open area (1,500 acres) the county road, a barbed-wire fence, a corral, and the unit's southern boundary road reduce a person's feeling of remoteness and seclusion, creating less than outstanding opportunities for solitude.

Offsite intrusions and influences are essentially nonexistent within the canyons. With such a lack of human influences, the occasional high altitude airline reminds a person of the outside world. A major commercial flight path connecting Los Angeles, Chicago, and New York, crosses over the Grand Gulch Plateau.

In summary, over 96 percent (44,940 acres) of the WSA has outstanding opportunities for solitude. Fifteen hundred acres do not meet the *Wilderness Act* criteria for solitude.

PRIMITIVE AND UNCONFINED RECREATION

Fish and Owl Creek Canyons are already well known for their primitive recreation opportunities. The Grand Gulch rangers will sometimes direct visitors to these canyons to experience a less-used, unique canyon system. A convenient loop hike is possible from the heads of the canyons to the junction and return. A trail register is currently in use at the end of the "cherry-stemmed" access road. Highway U-95 on the north and Snow Flat road on the south also provide convenient access. Fish, Owl, and McCloyds Canyons have intermittent running water throughout the drainages, which makes them very attractive during the warmer months.

Hiking and camping are the main recreational uses of these canyons. The upper forks of Fish and Owl Creek Canyons challenge the hiker with rugged terrain, while steep canyon walls provide rock scrambling opportunities for those entering or leaving the deep and narrow canyons.

Sheer pink sandstone cliffs, pinnacles, knobs, two arches, and an abundance of cliff dwellings all contribute to a high quality recreational experience.

In addition to the outstanding hiking and camping opportunities, the striking scenery makes for high quality sightseeing and photography. Although not outstanding because of low population concentrations, birdwatching and wildlife observation supplement a user's outdoor experience.

These opportunities allow all 46,440 acres in the WSA to meet the outstanding recreation criterion for areas under wilderness review.

SPECIAL FEATURES

The WSA offers supplemental features of scenic, archaeological, and historical value. These features enhance the other opportunities available within the unit.

The canyons of this unit offer a myriad of sandstone shapes and colors twisted and carved in eroded white, reds, browns, and yellows. In the lower Dry Wash area, the purples and greens of the Chinle Shale and Moenkopi Formations form a multi-colored landscape. In the sheer sandstone canyons, pinnacles, pedestals, knobs, arches, and alcoves offer unique and dramatic views around every meander.

Fish Creek WSA includes land extensively occupied by the Anasazi Indians from about 200 A.D. to 1300 A.D. The unit contains a wealth of pristine cultural resources. Not only are these of scientific interest, but they are scenic and make interesting discoveries for the recreationist.

An archaeological site on the unit's northeast border has been stabilized and surrounded by a chainlink fence. This site, called Comb Wash Overlook, has four tower bases and a wall on the mesa rim and rock shelter dwellings below. The well-preserved ruins, with a dramatic view of Dry and Comb Wash junctions, enhance a visitor's feeling of the history and the timelessness of the land.

The Hole-in-the-Rock Trail, the route followed by the Mormon settlers in 1879 to 1880, forms most of this unit's southern boundary. The pioneers camped at Snow Flat Spring Cave and built The Twist, a narrow twisting road through the rocks from the mesa down to the Comb Wash area.

In 1908, as part of a survey of Natural Bridges National Monument, W.B. Douglass of the General Land Office surveyed and described the Snow Flat Spring Cave. This was considered essential to the National Monument because it "... supplied the only available water at a necessary intermediate stopping point and was therefore essential to public travel."

Land Use Plans and Controls

There are five State-owned sections of land within the WSA. All other lands within the WSA, both surface and mineral estates, are Federally owned and BLM-administered. The management philosophy for all State sections is to maximize economic returns for the State school fund. Present uses on these lands are livestock grazing and mineral exploration.

There are also six sections of State-owned land adjacent to the WSA (including Section 16, Township 38 South, Range 19 East, which is "cherry-stemmed" out along with a county road passing through it). Other lands adjacent to the WSA are Federally owned, BLM-administered public lands.

A Public Water Reserve has been withdrawn in the WSA, involving part of four sections. During a recent review of withdrawals for public water reserves, it was recommended that this withdrawal be continued. The withdrawal is intended to protect and preserve bodies of water, springs, and water sources for public use. Valid and legitimate purposes for which water is reserved include stockwatering, human consumption, agriculture, and use by fish and wildlife and their habitat.

There are no rights-of-way within the WSA since county road No. 253 is "cherry-stemmed" out.

Access to the vicinity of the WSA is provided by State Highways U-95 and U-261, as well as by county roads to the boundary in several places. County roads form portions of the boundary in several places.

Contiguous Federal lands also are under BLM wilderness review to the south in the Road Canyon WSA. No lands contiguous to the WSA are under consideration by other agencies for wilderness.

The area is identified for multiple-use management by BLM in the South San Juan MFP, as noted in the description of the No Action Alternative. The South San Juan MFP is scheduled for replacement by the San Juan RMP in 1986.

The *San Juan County Master Plan* (Planning and Research Associates, 1967) zones the WSA as open range/forest lands or potential agricultural lands. The Master Plan predates wilderness considerations. The San Juan County Commission (1980) opposes any wilderness areas being legislatively or administratively designated in the county.

Socioeconomics

DEMOGRAPHICS

The WSA lies in central San Juan County. The nearest community is Blanding approximately 30 road miles away. The socioeconomic effects of designation would be confined mostly to San Juan County. The county can be summarized as rural and sparsely populated.

San Juan County had a 1982 population of 12,700, not quite 1 percent of the State population (University of Utah, Bureau of Economic and Business Research, 1982). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers. Monticello, the county seat, had a 1980 population of 1,930 and Blanding had a 1980 population of 3,120 (U.S. Department of Commerce [USDC], Bureau of the Census, 1981).

San Juan County is one of the largest counties in Utah, comprising 7,885 square miles (about the size of New Jersey). About 85 percent of the county is owned by the Federal Government, 6 percent by the State of Utah, and 8 percent by private landowners (University of Utah, Bureau of Economic and Business Research, 1982). The southern 20 miles of the county are included in the Navajo Indian Reservation.

EMPLOYMENT

Even though local employment in the mining industry decreased by 20 percent between 1980 and 1982 due to a downturn in local uranium mining and milling, it still remains the largest local private employer (Utah Department of Employment Security, 1983).

Recent statistics indicate that mining directly accounts for half of the income and over 32 percent of the employment in the county (USDC, Bureau of Economic Analysis, 1983). Because the mine and mine employees both purchase products locally, mining's total local importance is even greater. Government and tourism are San Juan County's next most important sources of employment and income. Table 8 shows employment for San Juan County. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are on welfare and are, therefore, not included in unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

TABLE 8
1981 Employment and Income
San Juan County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agricultural	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance and Real Estate	1	1
Services	8	11
Other	—	—
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	96
Unemployment (First Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

Note: Employment percentage figures include only wages and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services. Because of rounding, numbers are not additive.

INCOME AND REVENUES

Activities in the WSA that could be of some local economic consequence include mineral activities, livestock production, and dispersed nonmotorized recreation. Table 9 indicates local sales and Federal revenues for the WSA. Appendix 9 identifies the multipliers used to estimate income and revenues.

Sporadic exploration of the WSA for oil and gas has brought some income and temporary employment to residents of the area.

TABLE 9
Local Sales and Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Mining Claim Assessment	None	None
Oil and Gas Leases	None	$133,200
Livestock Grazing	$21,460	$1,502
Recreational Use	Less than $17,077	$1,000
Total	Less than $38,537	Up to $135,702

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total local income that would be generated by these expenditures.

Fifteen livestock permittees have grazing privileges in the WSA. Based on the consumption of 1,073 AUMs of forage by cattle, it is estimated that the WSA accounts for $21,460 of livestock sales, including $5,365 of ranchers' returns to labor and investment.

Historical hunting pressure in the WSA has been low, and its local economic importance is insignificant.

The WSA does support private and commercial recreation use. Judging from the points of origin to nearby recreation areas, approximately 85 percent of the WSA users pass through San Juan County's service centers. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use of the Fish Creek Canyon WSA is estimated to average about 4,165 visitor days per year, for a local recreation expenditure estimate of $17,077. For the most part these recreation-related expenditures are well distributed within the local economy and are of low significance to businesses. The two commercial outfitters who make use of the WSA, neither of which is based locally, could be exceptions, as commercial use of the WSA could contribute significantly to these operations with a related income of about $5,000 that would not go to the San Juan County economy.

The WSA generates Federal revenues from three sources: mineral leases, grazing fees, and recreation use permits. Within the WSA, about 44,399 acres are currently leased for oil and gas. At $3 per acre, this generates about $133,200 annually. Half of this, or about $66,000, is allocated back to the State of Utah. The State then reallocates these revenues to various funds, the majority of which are related to energy development. How much, if any, is distributed to the local level is not known. Based on 1,073 AUMs of forage consumed by livestock in the WSA and with the current annual grazing fee of approximately $1.40 per AUM, the WSA annually accounts for $1,502 of grazing fee revenues to the Federal Treasury. Half of this is allocated back to the local BLM district for construction of range improvement projects. The recreation land use permit fees of $1.00 per visitor day for commercial use of the WSA generate approximately $1,000 in revenues annually.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines For All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Futures users in the WSA would meet requirements of all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area (although the likelihood is thought to be very low) would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown but would probably be low due to the WSA's low mineral potential. Some changes could occur with vegetation treatments for increased livestock forage production. The following is a worst-case analysis based on the assumption that oil or gas would be developed sometime in the future and cause 160 acres of surface disturbance and that 2,100 acres of vegetation treatment and seeding would be carried out in the WSA. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed as a PSD Class II area. Disturbance of 160 acres would result in minor temporary increases in fugitive dust emissions. Disturbance on 2,100 acres could create noticeable dust conditions during the treatment and seeding process, but thereafter the new growth would stabilize the surface and eliminate dust occurrences. Because no major sources of air pollutant emissions are proposed in the vicinity of the WSA, over the long term air quality would remain essentially as at present.

GEOLOGY

No impacts to geology are expected because oil and gas exploration and development activities would probably not exceed 160 acres and would involve surface disturbances and widely spaced wells that would not change the geologic structure of the area. The vegetation treatment would be confined to the surface and would not affect geologic conditions.

SOILS

It is estimated that up to 160 acres of soil could be disturbed by oil and gas exploration and development. Assuming that disturbance would be spread equally over all soil types (with an average erosion rate of .66 cubic yards/acre prior to disturbance and 4.45/acre if disturbed) soil loss on the 160 acres would increase from approximately 106 cubic yards/year to approximately 712 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Erosion would not be expected to increase significantly in the 2,100-acre area disturbed by vegetation treatment and seeding due to the timing of the treatment, the mulching effect of vegetation left on the land surface, and the anticipated rapid germination and regrowth of grass species. While there could be a small temporary increase in soil loss for up to 1 year, over the long term, soil

erosion would be significantly reduced in the seeded area. Therefore, under this alternative, maximum annual soil loss in the WSA would increase by as much as 606 cubic yards (approximately 2 percent) over the current annual soil loss of 31,114 cubic yards to approximately 31,826 cubic yards per year.

VEGETATION

Although protective measures would be taken to avoid disturbance of the sensitive plant species *Astragalus cottamii, Astragalus monumentalis, Erigeron kachinensis*, and *Zigadenus vaginatus* some individual plants could be inadvertently lost as a result of oil or gas exploration and development. Before authorizing surface-disturbing activities (2,260 acres potential) the BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy. If threatened or endangered species could be affected, the BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act (refer to Appendix 4). Appropriate mitigating measures would be applied. Because necessary measures would be taken to protect these plants, it can be reasonably concluded that the viability of populations of threatened, endangered, or sensitive plant species would be preserved under the No Action Alternative.

Other than on the 2,100 acres of proposed vegetation treatment, there would not be a major change in any vegetation type within the Fish Creek Canyon WSA.

WATER RESOURCES

Although precipitation is low, gradual sedimentation or change in total dissolved solids (TDS) could occur in Fish Creek Canyon WSA from as much as 606 cubic yards of annual soil loss from surface disturbance, depending on the location of oil and gas activities in the WSA. This would probably be a small increase in sedimentation because of stipulations applied to oil and gas leases under Category 2 and 3 to protect watershed values. Oil and gas exploration and development in the area would generally be confined at or near the surface or with widely spaced wells and would not significantly change ground water quality or quantity. Opportunities for future water developments exist under this alternative, but none are planned in the current MFP.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

The potential for up to 10 million barrels of oil and up to 60 billion cubic feet of natural gas (in-place) exists within the WSA. Up to 3 million barrels of oil and 18 billion cubic feet of gas could be recoverable. These oil and gas resources could be explored and developed, subject to Category 2 (standard and special stipulations) on about 19,310 acres and Category 3 (no surface occupancy) on about 26,010 acres. Approximately 1,120 acres would continue to be closed to leasing. Because most of the area would be managed as no surface occupancy, the operator's ability to explore and develop the area would be limited. As much as 160 acres of surface disturbance could take place if exploration and development were to occur. Due to the small size of possible deposits as well as the restrictive stipulations throughout the area, production is not expected under this alternative.

Locatable Minerals

The entire WSA would remain open to mining claim location, and development would not be restricted by wilderness constraints. However, there are no locatable mineral deposits projected to be in-place or recoverable in this WSA, and therefore no disturbance is likely to occur from exploration and development.

WILDLIFE

As much as 160 acres of surface disturbance could occur from oil or gas exploration and development under this alternative. Mobile animals such as mule deer would leave the area of disturbance and less mobile animal populations would be reduced during the time of disturbance. There would be no impacts to threatened or endangered animal species under this alternative because none are present within the WSA. There are also no critical or crucial habitats that could be affected. The proposed 2,100-acre vegetation treatment would adversely affect wildlife temporarily as the work was completed. However, in the long term, wildlife would benefit from increased habitat diversity.

FOREST RESOURCES

Harvest of the woodland products in this WSA for private or commercial uses would be allowed under this alternative, but probably would not exceed current low levels of use due to limitations

on resource potential and the topographic restraints on access, as well as the greater availability of the pinyon-juniper resource elsewhere. As in the past, firewood gathering would continue to occur along the western boundary of the WSA from Highway U-95 to Snow Flat. Less than 4,275 cords are estimated to exist in the WSA.

LIVESTOCK

Grazing would continue at the present or at an increased level. The 2,100 acres of proposed land treatments would provide a potential increase of 500 AUMs with this alternative. The 15 operators with cattle use could continue to allow grazing of the estimated 1,073 AUMs existing within the WSA. The WSA contains 16 percent of the total allotments affected. The existing range projects (four fences, 350-acre seeding, and two reservoirs) could be maintained by motorized means. Additional facilities could be proposed in the future without regard for wilderness values. Overall, there would be few changes in livestock management.

The potential for agricultural use of portions of this WSA would not be foregone, although such use is unlikely and has not been recommended in the MFP.

VISUAL RESOURCES

Under this alternative, visual quality in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., 1,120 acres would be closed to oil and gas leasing, 26,010 acres would be managed as leasing Category 3 (no surface occupancy), and 28,000 acres would be managed under VRM Class II objectives requiring that activities not be apparent).

Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual values in areas affected by the estimated 160 acres of surface disturbance from oil or gas exploration and development would be degraded and VRM Class II and III management objectives would probably not be met in disturbed areas during the short term. After rehabilitation, visual resources would be restored to meet VRM Class II and III objectives. Even after mitigation and rehabilitation, some permanent localized degradation could result. Because of Category 3 leasing stipulations, roads, vehicular ways, and drill pads would be limited to certain areas, and visual quality would not be significantly reduced in the area as a whole. Visual change would also be expected with the 2,100-acre seeding, although the activity would be designed to meet VRM class standards as much as possible.

CULTURAL RESOURCES

Cultural resources could be impacted by disturbance of 2,100 acres of vegetation manipulation for livestock grazing and disturbance of 160 acres, including additional roads and ways for motorized access resulting from oil or gas exploration and development. However, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would lessen impacts. Also, oil and gas related disturbance would be limited to the 19,310-acre area managed as leasing Category 2 (42 percent of the WSA) and would not occur throughout the WSA; therefore, conflicts with cultural values would be partially avoided. Still, some of the 40 recorded and 5,445 potential sites (3,630 of which could be National Register eligible) could be foregone.

Vandalism of sites (currently a problem in San Juan County) would be expected to increase in proportion to the general population increase, as well as any increase in roads from energy exploration. Experience in other portions of this region indicates a direct correlation between additional access and sites vandalized for illegal artifact collection purposes.

Stabilization efforts and excavation could be completed without wilderness considerations and would, therefore, be easier to conduct under this alternative.

RECREATION

Up to 160 acres could be disturbed by oil and gas activities. Primitive recreational opportunities and quality would be diminished on the affected areas. Disturbance would be largely limited to the 19,310-acre area that would be managed as leasing Category 2 (standard and special stipulations). Roads and ways created for mineral exploration and development would improve access into the area for nonprimitive recreation. The future trends in recreational use of the WSA are unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use is expected to increase from the 4,165 average current visitor days per year to about 6,206 visitor days at the end of 20 years. Assuming that the 2-percent increase would be uniform among all recreation uses in the WSA, primitive recreational use would increase from the estimated current

use of 4,115 visitor days per year to about 6,131 visitor days per year over the next 20 years. Commercial outfitting opportunities could benefit from the increase in primitive recreational use. Recreational activities utilizing vehicular access (ORVs, sightseeing, etc.) would increase from about 50 visitor days per year to about 75 visitor days. The approximately 19.8 miles of existing vehicular ways, as well as new access roads and ways from energy exploration, would provide vehicular access that could increasingly conflict with nonmotorized uses where their areas of use overlap, reducing the quality of the primitive recreationist's experience.

WILDERNESS VALUES

Possible oil and gas exploration and development could disturb an estimated 160 acres. Wilderness values in this WSA (i.e., naturalness, opportunities for solitude and primitive recreation, and special features including cultural and aesthetic values) would be lost or diminished in affected areas during the time of exploration and development. The wilderness values in the area as a whole would probably not be lost because of low oil and gas potential and because disturbance from any oil or gas development would be limited to the 19,310-acre area (42 percent of the WSA) that would be managed as leasing Category 2 (standard and special stipulations); therefore, impacts would not occur throughout the area. Although mineral location could occur, no development is likely due to the lack of locatable mineral resources in the area. The disturbance from the 2,100-acre planned seeding would result in loss of existing wilderness values in the affected area. Motorized use in the WSA would impact solitude and primitive recreation opportunities.

LAND USE PLANS AND CONTROLS

This alternative is based on implementation of the BLM South San Juan MFP and the forthcoming San Juan RMP and, therefore, would be in conformance with these plans. This alternative would be consistent with the *San Juan County Master Plan* because land use would continue as at present. This alternative would also be consistent with State of Utah plans and policies that emphasize economic return. The withdrawal for public water reserves would continue to protect waters for public uses and water could be developed for use. Should the contiguous Road Canyon WSA be designated wilderness, nondesignation of the Fish Creek Canyon WSA would not complement the management of the adjacent unit.

SOCIOECONOMICS

Overall, no changes in existing patterns or trends of population, employment, or distribution of local income would be expected.

There would be no local mineral-related employment or income impacts because the existing ability to explore and develop mineral resources would remain as at present. Although the opportunity would continue for economic development of minerals under this alternative, the likelihood is minimal due to lack of resource potential.

There could be livestock-related economic benefits from a possible 500-AUM increase from the planned vegetation treatment. This could add up to $10,000 in livestock sales attributed to the increased forage in the WSA.

Recreation use and related local expenditures would increase. As a result of the predicted increase of 2,041 visitor days, recreation-related annual expenditures in the region could increase by about $8,368 (to a total of $25,445). Commercial recreation income would increase by an estimated $1,000 per year (to a total of $6,000).

State and local revenues would not be affected. Federal grazing revenues would increase by as much as $700 annually due to the proposed increase of 500 AUMs. Federal revenues from recreation permits could increase an estimated $20 per year.

All Wilderness Alternative (46,440 Acres)

As noted in the Description of the Alternatives section, the major changes that could occur in the 46,440-acre area would be related to withdrawal from mineral location, closure to new mineral leasing, and cancellation of the proposed 2,100-acre vegetation project. The entire area would be placed in leasing Category 4 (closed to leasing). About 19.8 miles of existing vehicular ways in the WSA would be closed to vehicular use except for approvals by BLM, as discussed in the Description of the Alternatives section. The WSA would be managed under VRM Class I.

For the following analysis, it is assumed that the WSA would remain unencumbered with mining claims until the time of designation because of lack of locatable mineral potential. After designation, the area would be closed to mineral location. It is, therefore, assumed that no surface disturbance would occur from exploration and development of locatable minerals. It is also assumed that the existing oil and gas leases would expire

before production of commercial quantities, and that oil and gas leases would not be renewed or future leasing of oil and gas allowed. Therefore, no surface disturbance for exploration and development of leasable minerals is anticipated with this alternative. Also, no surface disturbance from vegetation treatments would occur with this alternative.

Because potentially disturbed areas would be smaller than with the No Action Alternative (0 vs. 160 acres for minerals plus 2,100 acres for vegetation treatment), the impacts from development and surface disturbance on air quality, geology, and wildlife would be less under the All Wilderness Alternative than those described for the No Action Alternative. Because the analysis of the No Action Alternative shows that impacts to these resources would be insignificant, they are not discussed under the All Wilderness Alternative. Other effects on these resources due to changes in management are addressed below.

SOILS

The soil resource would benefit under the All Wilderness Alternative because of the reduced likelihood for surface-disturbing activities, which are not expected under this alternative. Soil loss from erosion could be expected to continue at current rates of 31,114 cubic yards/year within the WSA. This would be 606 cubic yards/year less soil loss than under the No Action Alternative.

VEGETATION

Inadvertent disturbance of *Astragalus cottamii, Astragalus monumentalis, Erigeron kachinensis*, and *Zigadenus vaginatus*, all sensitive plant species, would not occur under this alternative.

WATER RESOURCES

Wilderness designation and the reduced likelihood for surface-disturbing activities would protect the water quality of Fish Creek and the 10 springs along the length of Fish and Owl Creeks.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Most of the WSA is under oil and gas lease (32,500 acres of existing leases are pre-FLPMA and 11,899 acres are post-FLPMA). No exploration or development of oil and gas is presently occurring within the WSA. All wells drilled in or near the WSA have been dry holes that are plugged and abandoned.

Existing pre- and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases will be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases will not be reissued.

Exploration for and development of a potential resource of less than 3 million barrels of oil or less than 18 billion cubic feet of natural gas considered recoverable would be foregone under this alternative. However, due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities, it is concluded that this alternative would not result in any significant loss of potential oil and gas recovery.

Locatable Minerals

After designation, all lands in the WSA would be closed to prospecting and mining (USDI, BLM, 1981). Because production of locatable minerals is not currently occurring (no claims are in existence or likely to be located) and because the area has no potential for locatable minerals, this alternative would not result in a significant impact to locatable mineral recovery.

FOREST RESOURCES

Under this alternative, no woodland harvest would occur other than pine nut gathering and nonmechanized collection of dead-and-down wood for use by wilderness visitors. The estimated 4,275 cords of fuelwood foregone would not be a significant impact to recovery of woodland products due to limited existing and potential use in the WSA and the availability of woodland products closer to population centers.

LIVESTOCK

Grazing use could continue with no substantial change. The 15 operators with cattle use could continue to allow grazing of the estimated 1,073 AUMs within the WSA. The WSA contains an average of approximately 16 percent of the total allotments. The existing range projects (four fences, a 350-acre seeding, and two reservoirs) would continue to be maintained as in the past based on practical necessity and reasonableness. The 2,100 acres of proposed land treatments and potential increase of 500 AUMs would be foregone with designation. The closure of approximately 19.8 miles of ways would have little effect on livestock management in the WSA.

The potential for agricultural use of portions of this WSA would be foregone, although such use is unlikely even without wilderness designation.

VISUAL RESOURCES

Wilderness designation would result in the preservation of the area's high quality visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I (which generally allows for only natural ecological change) and through closure of the entire area to ORV use and to future mineral leasing and location. No surface disturbance from mineral, energy, or rangeland developments would be expected under this alternative.

CULTURAL RESOURCES

Although cultural resources are protected by existing Federal laws, wilderness designation of the WSA would give extra protection to cultural resources by limiting the amount of surface-disturbing activity (especially additional roads) and by restricting motorized access. Experience in other portions of this resource area indicates a direct correlation between additional access and sites vandalized for illegal artifact collection. The 40 recorded and 5,445 potential sites (3,630 of which are potentially National Register eligible) would thus be protected.

Additional visitation into the WSA could accelerate deterioration of the more accessible cultural sites. Stabilization and scientific excavation would be allowed, but would have to be done in a manner compatible with the wilderness setting. Still, the protection afforded by wilderness management would outweigh problems from increased recreational activity and restrictions on cultural resource management. The overall impact would be positive.

RECREATION

Primitive recreation activities would be enhanced due to the limitation of surface-impacting activities and the elimination of motorized uses. Use of the WSA would probably increase at an accelerated rate due to additional public awareness of the values present. As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year in Utah over the next 20 years in relation to normal population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an estimated increase in primitive recreational use to about 9,288 annual visitor days. Management provided through a Wilderness Management Plan would avoid destructive increases in future recreation use, and the quality of the primitive recreation experience probably would not be negatively affected by the increased use. The 75 visitor days of ORV use in the WSA that could occur without designation would be eliminated from the WSA. Because there are other suitable ORV play areas in San Juan County, ORV use probably would not experience an overall decline in the general vicinity. Commercial outfitting would benefit. In addition to the existing commercial users, other commercial operations based on primitive recreational activities could apply for use of the WSA as demand increases.

WILDERNESS VALUES

The wilderness values present in this WSA would be protected and preserved through wilderness designation by Congress.

Naturalness (on 46,440 acres) and outstanding opportunities for solitude (on 44,910 acres) and for primitive and unconfined recreation (on 46,440 acres) would be preserved and enhanced due to the restrictions on surface-disturbing activities and motorized uses. No surface disturbance from mineral development is anticipated under this alternative. Currently some ORV use is made by recreationists and others, generally along existing ways. This motorized access into the WSA would be closed to general vehicle use. Existing ways (19.8 miles) would slowly reclaim through natural processes.

Wilderness designation on 46,440 acres would protect the special features present throughout the WSA. The 40 recorded and 5,450 potential sites (3,630 of which are potentially National Register eligible) would be protected, as would the historic and scenic values.

Nonmotorized recreation uses of the WSA such as hiking and camping would probably increase with public awareness due to wilderness designation. This increase in use is not expected to substantially decrease opportunities for solitude and unconfined recreation because of the large size of the WSA, vegetation screening, and the length, forks, and meandering of the canyons.

LAND USE PLANS AND CONTROLS

The existing BLM South San Juan MFP does not provide for wilderness designation. The forthcoming San Juan RMP will acknowledge the wilderness study but will not cover wilderness designation. Congressional designation of the WSA as wilderness would be an amendment to the applicable BLM land use plan. Certain water

developments (e.g. reservoirs) on the area withdrawn as a Public Water Reserve might not be possible following wilderness designation. Therefore, wilderness designation might conflict with the intent of the withdrawal. If the contiguous Road Canyon WSA were designated as wilderness, designation of this WSA would complement management of that unit.

The *San Juan County Master Plan* recommends multiple use of all public lands in the county. Specifically, the WSA is classified as potential future agriculture land or open range-forest lands. This alternative would conflict with the county's multiple-use concept because the area would be closed to mineral leasing and location. Designation would also conflict with agriculture and forest land classifications.

State lands within the WSA would be exchanged; thus, wilderness designation would not conflict with the policy of the State of Utah to maximize economic returns.

SOCIOECONOMICS

Designation of this WSA as wilderness is not expected to result in any significant changes to existing patterns and trends of population, employment, and local income distributions.

Although future mineral development and related employment would be foregone with designation, it is unlikely that minerals would ever be commercially produced from this WSA even without wilderness designation. (The WSA's most favorable mineral rating is a low potential for small oil and gas deposits.) Approximately $133,200 of annual Federal oil and gas leasing revenues (44,399 acres leased at $3.00 per acre), half of which is allocated to the State, would no longer be received after all leases expire.

The area would continue to be used for grazing as in the past. New rangeland improvements would be allowed only if they were primarily for the purposes of resource protection and management and if wilderness protection criteria could be met (refer to Appendix 1). The planned 2,100-acre seeding with a potential increase of 500 AUMs would be foregone with designation, along with an estimated $10,000 resulting increase in future livestock sales. An additional $700 in grazing fee revenues (at $1.40 per AUM) that would have been derived from the proposed seeding would be lost to the Federal Treasury under this alternative.

Designation would increase the public awareness of the WSA's recreational opportunities; this awareness could increase levels of recreation use. At the 9,288 visitor day level of projected annual use with designation, expenditures associated with recreation in the WSA would account for an estimated $38,081. Generally, these expenditures would be well distributed among businesses in San Juan County and would be of low local significance. However, by increasing public awareness, designation could also increase the demand for and income to commercial outfitter services. Income to these commercial operators would be an estimated $11,150. The possible increased use by commercial outfitters would increase the revenues collected from recreation use permits to an estimated $2,230.

Overall, designation would not affect nearby communities to such a degree as to noticeably affect their existing socioeconomic conditions.

Partial Wilderness Alternative (35,220 Acres) (Proposed Action)

The major activities that would occur in the designated portion of the WSA for this alternative are the same as described for the All Wilderness Alternative. For the nondesignated portion, management would be as described for the No Action Alternative. The specific actions that would take place within the 35,220-acre area designated as wilderness and the 11,220-acre nondesignated area are discussed in the Description of the Alternatives section.

It is assumed that, because of geologic unfavorability, there would be no surface disturbance related to locatable mineral exploration and development in either the designated or nondesignated portion of the WSA.

It is assumed that, in the designated area, existing oil and gas leases would expire before production of commercial quantities and that leases would not be renewed or future leasing allowed. Therefore, no surface disturbance from exploration or development is anticipated to occur in this area. Also, no surface disturbance from vegetation treatments would occur since the proposed 2,100-acre site would be entirely within the designated portion and the treatment would not be allowed.

It is assumed that, within the nondesignated area, as much as 38 acres would be disturbed sometime in the future due to oil and gas exploration and development. This projected disturbance within the WSA would be 122 acres less than projected under the No Action Alternative and 38 acres more than with the All Wilderness Alternative. (Appendix 10 lists the surface disturbance

assumptions and estimates for minerals in the WSA.)

Restrictions on management and development methods within the WSA would result in essentially the same impacts to air quality, geology, vegetation, wildlife, and forest resources and to land use plans and controls as described for the All Wilderness Alternative. The following analysis describes only the measurable differences.

SOILS

It is estimated that up to 38 acres of soil could be disturbed by mineral exploration and development. No disturbed acres would be within the designated portion and 38 acres would be disturbed in the nondesignated area. The average rate of soil loss at present is estimated at .66 cubic yards/acre/year. Soil loss in the designated portion would continue at this existing rate. Soil loss in the nondesignated portion on the 38 acres would increase from 25 cubic yards/year to 169 cubic yards/year. Soil loss in disturbed locations would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Since all of the proposed vegetation treatment would be within the designated portion and, therefore, not allowed as in the All Wilderness Alternative, there would be no related effect on soils.

Therefore, under the Partial Wilderness Alternative, maximum annual soil loss within the WSA would increase by approximately 144 cubic yards (less than .5 percent) over current annual soil loss.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

OIL AND GAS

The area that would be designated wilderness would be closed to new mineral leasing. Approximately 34,699 acres of the area are currently under lease (22,800 acres pre-FLPMA and 11,899 acres post-FLPMA). It is unlikely that existing leases would be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases would not be reissued.

It cannot be determined how much of the existing potential resource of 3 million barrels of oil and less than 18 billion cubic feet of natural gas considered recoverable is within the area that would be designated as wilderness under this alternative. Assuming that the loss of potential resource recovery would be in direct proportion to the size of the area designated, exploration and development of a potential resource of up to 2 million barrels of oil and 14 billion cubic feet of natural gas could be foregone. This would allow recovery of 1 million more barrels of oil and 4 billion more cubic feet of natural gas than with the All Wilderness Alternative. However, due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood for exploration and development activities, this alternative is not expected to result in any significant loss in recovery of leasable minerals.

Locatable Minerals

On the designated portion of the WSA (35,220 acres), lands would be closed to future prospecting and development (USDI, BLM, 1981). Claims that are filed in this area prior to designation (none currently exist) could be worked in accordance with valid existing rights, subject to unnecessary or undue degradation provisions.

On the undesignated portion of the WSA (11,220 acres), lands would remain open to mineral location and development. Development would not be limited by wilderness protection considerations.

Due to geologic unfavorability, this WSA has no potential for locatable minerals. Designation of 35,220 acres of the WSA would have no effect on the recovery of locatable minerals.

LIVESTOCK

Designating 35,220 acres of the WSA as wilderness would impact domestic livestock grazing essentially the same as with the All Wilderness Alternative. Of the 1,073 AUMs allocated, approximately 750 AUMs would be within the designated portion of the WSA and 323 AUMs would be within the nondesignated portion. Of the three allotments affected, approximately 12 percent of the total acreage would be in the designated area of the WSA and approximately 7 percent of the total acreage would be in the undesignated area. The existing range developments could continue to be maintained as in the past based on practical necessity and reasonableness. New rangeland improvement facilities in the designated portion could be restricted to preserve wilderness values. The 2,100-acre vegetation treatment planned in this portion of the WSA probably would not be allowed. The 500 additional AUMs that could result from such a seeding would thus be foregone. Of the 19.8 miles of existing vehicular ways, about 6.8 miles are within the area that would be designated. This would reduce the potential for inconvenience to permittees who may presently use the ways for livestock management.

In the nondesignated portion livestock facilities, including 13 miles of ways and two stock reservoirs, would be available for use and maintenance without concern for naturalness, solitude, and primitive recreation values.

VISUAL RESOURCES

Management would be in accordance with VRM Class I on the 35,220 acres that would be designated. Surface-disturbing activities, including the 2,100-acre vegetation project, would not be allowed in this area. Approximately 19,140 acres of Class A (high quality) scenery are in this portion of the WSA and would be protected in the natural state.

The VRM class in the undesignated portion of the WSA would remain Class II on 8,860 acres and Class III on 2,360 acres. In this area, as much as 38 acres of oil and gas related disturbance could occur. Approximately 8,860 acres of Class A scenery are in this area.

Because mineral-related surface disturbance in the WSA could be as much as 38 acres under this alternative, as opposed to 160 acres under the No Action Alternative and 0 acres under the All Wilderness Alternative, the potential for impact on visual resources would be less than under the No Action and slightly more than under the All Wilderness Alternative. In the undesignated areas, although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality could be degraded and VRM Class II and III management objectives might not be met during the short term on disturbed areas. Even after rehabilitation some permanent localized degradation could be expected. As previously noted, the potential for mineral development in the WSA is low; therefore, the probability for related visual impacts would also be low.

CULTURAL RESOURCES

Wilderness designation of the 35,220-acre portion would benefit cultural resources by limiting the amount of surface-disturbing activities (such as additional roads) and restriction of motorized access. This alternative would protect 39 recorded sites and 4,087 potential sites (2,750 of which could be National Register eligible). Experience in other portions of this region indicates a direct correlation between additional access and sites vandalized for illegal collection purposes. The additional visitation in the WSA has the potential for accelerated deterioration of the more accessible cultural sites. Although stabilization and scientific excavation would be allowed, it would have to be completed in a manner compatible with the wilderness setting. It is concluded that there would be a beneficial impact from this Partial Wilderness Alternative.

On the nondesignated portion one recorded site and 1,358 potential sites (880 of which may be potentially National Register eligible) would receive protection under existing laws, but would not receive the added protection of wilderness designation.

RECREATION

Motorized recreation would not be allowed on 35,220 acres in the portion designated wilderness. About 6.8 miles of ways that are now occasionally used by recreationists would be closed; however, other locations are available for this type of recreation use. This would eliminate the potential for conflicts with nonmotorized recreation in this portion of the WSA. The primitive recreation activities would be enhanced due to the limitation of surface-impacting activities and the elimination of motorized uses. This would be significant inasmuch as the main features and canyons of the WSA would be included within the designated portion. Visitation to the wilderness area would be an estimated 7,044 visitor days per year.

Motorized recreation could occur on 11,220 acres, including the approximately 13 miles of ways, in the nondesignated area. Although ORV-type use in this area currently is low, vehicular use likely would increase somewhat and primitive recreation opportunities could be reduced.

WILDERNESS VALUES

Impacts to wilderness values would be the same as under the All Wilderness Alternative on the 35,220 acres that would be designated wilderness. Wilderness designation would contribute to the preservation of the area's wilderness characteristics. Under this alternative, the potential for surface-disturbing activities that could impair wilderness values would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through the ORV closure, and through closure of the area to future mineral leasing and location.

Naturalness on 35,220 acres would be protected, mainly due to the restrictions on surface-disturbing activities and motorized uses. There are currently 6.8 miles of ways providing motorized access into the WSA that would be closed to general vehicle use. This would enhance and protect the wilderness values present, as the ways

would slowly reclaim through natural processes. The quality of naturalness would be enhanced.

Outstanding opportunities for solitude and primitive, unconfined recreation would be preserved on 35,220 acres. Visitor use likely would increase due to public awareness of the WSA through wilderness designation. This increased use is not expected to substantially decrease opportunities for solitude because of the large size of the unit, vegetation screening, and the length, forks, and meanderings of the canyons.

Wilderness designation of 35,220 acres would protect the special features present. The 39 recorded and 4,087 potential sites (2,751 of which are of potentially National Register eligible) would be protected, as would the historic and much of the scenic value of the WSA.

In the 11,220-acre area that would not be designated, there would be as much as 38 acres of disturbance from mineral and energy exploration and development activities. If occurring, these activities could degrade the wilderness values of naturalness on 11,220 acres and outstanding opportunities for solitude on 9,720 acres and primitive and unconfined recreation on 11,220 acres.

The one recorded archaeological site and 1,358 potential sites (880 of which are potentially National Register eligible) in the nondesignated portion would not receive the extra protection of wilderness management, nor would the historic or scenic values have wilderness protection in this portion of the WSA.

SOCIOECONOMICS

Designation of 35,220 acres of this WSA as wilderness is not expected to result in any significant changes to existing patterns and trends of population, employment, and local income distributions.

Although future mineral development and related employment would be foregone with designation, it is unlikely that minerals would ever be commercially produced from this WSA even without wilderness designation. (The WSA's most favorable mineral rating is a low potential for a small oil and gas deposit.) Approximately $101,337 of annual Federal oil and gas leasing revenues (33,379 acres leased at $3.00 per acre), half of which is allocated to the State, would no longer be received after all leases expire on the designated portion. In the nondesignated portion, 11,020 of existing leases would continue and could be reissued, resulting in continuation of up to $33,060 in annual Federal revenues.

The area would continue to be used for grazing as in the past, with income and revenues as shown in Table 9. New rangeland improvements would be allowed only if they were primarily for the purposes of resource protection and management and if wilderness protection criteria (refer to Appendix 1) could be met. As with the All Wilderness Alternative, the planned 2,100-acre vegetation project, with a potential increase of 500 AUMs, would be foregone with designation, along with the resulting increase in income and revenues. There would be little or no effect on the local level. An additional $700 in grazing fee revenues (at $1.40 per AUM) that would have been derived from the proposed seeding would be lost to the Federal Treasury under this alternative.

Designation would increase the public awareness of the WSA's recreation opportunities; this awareness could increase levels of recreation use. Recreation use is projected to be about 7,044 visitor days, with an estimated local expenditure of $28,880. Income to two nonlocal commercial operators would be an estimated $8,475. The possible increased use by commercial outfitters would increase the revenues collected from recreation use permits.

Overall, designation would not affect nearby communities to such a degree as to noticeably affect their existing socioeconomic conditions.

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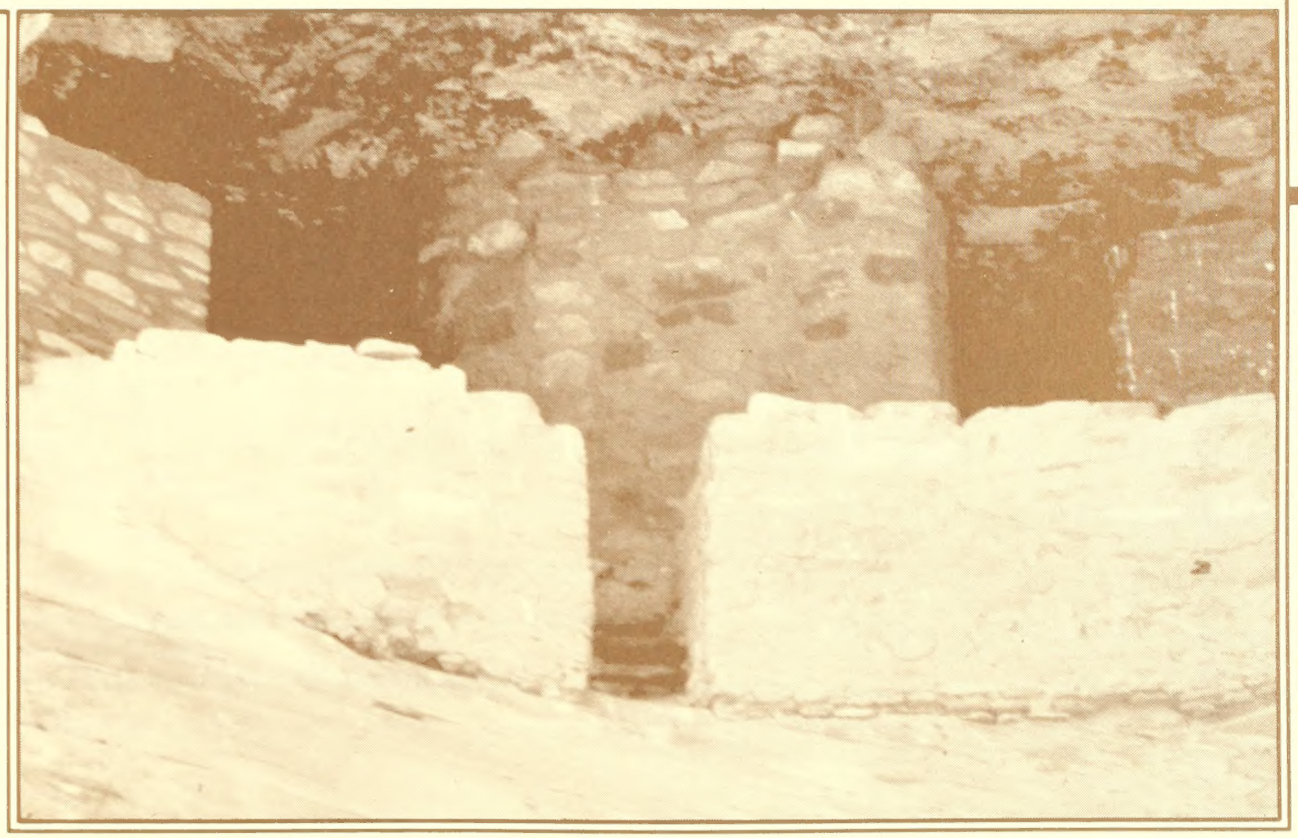
Mule Canyon WSA



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INTRODUCTION

General Description of the Area

The Mule Canyon Wilderness Study Area (WSA) is comprised of 5,990 acres of public land located in the south-central portion of San Juan County, approximately 30 miles west of Blanding, Utah. The unit was listed as 5,600 acres during the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980); however, a more accurate measurement established the acreage at 5,990 acres. The unit is approximately 5 miles long and 2.25 miles wide lying along a northwest to southeast axis. A railing on Texas Flat and a bladed dirt road form the north and east boundaries. The Manti-LaSal National Forest forms the west boundary and State Highway 95 (U-95) forms the south boundary.

The principal features of the WSA are two similar canyons typified by alternating bands of red and white sandstone and the presence of a rich variety of cultural resources. The predominant vegetation type is pinyon-juniper woodland. Small acreages of sagebrush and riparian vegetation are also present. Nearly half of the WSA is wasteland or slickrock.

Information on the climate of the WSA is limited because the nearest weather station is at Natural Bridges National Monument, 10 to 15 air miles from Mule Canyon. Since the elevations at Bridges and Mule Canyon are similar, it is assumed the weather is similar.

The annual average temperature in the area is 51 degrees Farenheit (F), the average annual low temperature is 37 degrees F, and the average annual high temperature is 65 degrees F. Annual precipitation ranges from 12 to 16 inches over Mule Canyon. January, May, and June are the driest months. July, August, and December are the wettest months. Annual total snowfall averages 40 inches.

Specific Issues Identified in Scoping

General issues pertaining to more than the Mule Canyon WSA are discussed in Volume I. Issues and concerns raised in public scoping meetings (USDI, BLM, 1984) and specific to Mule Canyon WSA are responded to below. Issues and concerns raised previous to the public scoping meetings include the need to discuss impacts to grazing use, archaeology, and the availability and use of firewood in San Juan County; these are discussed in this document.

1. *Comment:* This WSA has a high erosion hazard and areas that could receive erosion control measures and should not be designated wilderness.

Response: Approximately 35 percent of the WSA is in an area of steep canyon sides with high erosion potential if disturbed (refer to the Soils sections of this document for details). No erosion control measures are planned for this area. Impacts to soils resulting from designation and nondesignation are discussed in the Environmental Consequences section. Wilderness designation would benefit soils by preventing surface-disturbing activities.

2. *Comment:* Does this area have oil and gas leases and mining claims significant enough to indicate important mineral resources ?

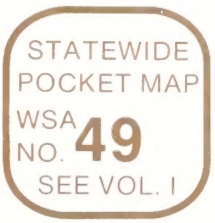
Response: The WSA contains pre-FLPMA (Federal Land Policy and Management Act) oil and gas leases on 2,180 acres and post-FLPMA leases on 3,410 acres. Science Applications, Inc. (SAI, 1982) has given the area a low favorability for oil and gas. There are two mining claims (totaling less than 40 acres) in the WSA. SAI has given a low favorability rating for all locatable minerals in the WSA (refer to the Affected Environment, Mineral and Energy Resources section).

3. *Comment:* There is one grazing allotment in the area.

Response: The Mule Canyon WSA contains a portion of the Texas-Muley Grazing Allotment. Refer to the Affected Environment, Livestock section.

4. *Comment:* Would wilderness designation be consistent with local and State land use planning?

Response: Wilderness designation probably would not be consistent with local planning (refer to the Affected Environment, Land Use Plans and Controls section). No State land is



located in the WSA; therefore, State land uses would not be affected by designation.

5. *Comment:* The small size of the area makes the opportunity for solitude very limited.

Response: Due to the terrain and vegetation in the north and south forks of Mule Canyon, over 86 percent (5,190 acres) of the WSA meets the outstanding solitude criteria. Refer to the Affected Environment, Wilderness Values section.

6. *Comment:* Dense tree cover cuts the view of U-95 in the 800-acre area that was deleted because opportunities for solitude were questioned.

Response: Sights and sounds from adjacent U-95 limit opportunities for solitude in 800 acres of the WSA up to the rim of the South Fork of Mule Canyon. North into the unit, the pinyon juniper forest and deep canyons prevent the highway from being an influence. The 800-acre area in question has not been deleted from the WSA and is included in the All Wilderness Alternative.

7. *Comment:* Sounds from U-95 can be heard in the WSA.

Response: Refer to the response to the previous comment.

8. *Comment:* Arch Canyon, under appeal to the Interior Board of Land Appeals (IBLA), is adjacent to Mule Canyon WSA. The two areas should be considered together, with the Texas Flat road "cherry-stemmed," as it should have been in the inventory.

Response: The Texas Flat road completely separates the two areas and could not therefore be "cherry-stemmed." The Arch Canyon area is not under appeal to IBLA.

9. *Comment:* The rationale for excluding this WSA in the Site-Specific Analysis (SSA) was not justified considering the high quality wilderness and archaeological values present.

Response: During scoping for this Environmental Impact Statement (EIS), BLM presented a preliminary indication of areas considered suitable or unsuitable for wilderness designation. The indication of preliminary suitability was made public prior to the EIS to obtain further input that has assisted in the formulation of the EIS alternatives. Additional input is expected as a result of the public review and comment on the Draft EIS. At the conclusion of the EIS process, BLM will review and consider all of the information received, and at that time, will formulate a final recommendation of areas found suitable for wilderness designation. Rationale for such recommendations will be included in a Wilderness Study Report to be submitted to the Secretary of the Interior and, subsequently, to Congress. The rationale will be keyed to the criteria of the "Wilderness Study Policy" (USDI, BLM, 1982) and to other resource management factors generally as decribed in Chapter 2, Volume I of this EIS.

10. *Comment:* The SSA states the area could better be used for activities other than primitive forms of recreation. However, on the next page it states that Mule Canyon is quite inaccessible to vehicles. What kind of recreation is contemplated?

Response: The canyons offer excellent day-hiking opportunities. Deer hunting in the Cedar Mesa and Dog Tank Spring area has been popular in the past. Motorcycle and vehicle tracks have been found in the Texas Flat area and toward the canyon, indicating off-road vehicle (ORV) use.

11. *Comment:* The analysis indicates solitude would decrease with increasing recreational use. This ignores management and would be a problem only if an increase in visitors did develop (past use has been slight).

Response: The effect that management would have on increased use is considered in the Environmental Consequences of Alternatives, Wilderness Values sections.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated From Detailed Study

No alternatives were identified for this WSA during scoping other than those analyzed.

Alternatives Analyzed

Two alternatives are analyzed for this WSA: (1) No Action; and (2) All Wilderness (5,990 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative.

These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 5,990-acre Mule Canyon WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the South San Juan Planning Unit Management Framework Plan (MFP) (USDI, BLM 1971) until that plan is superseded by the San Juan Resource Area Resource Management Plan (RMP) currently scheduled for completion in 1986. The one section of State land adjacent to the WSA (refer to Map 1) has not been identified in the MFP for special Federal acquisition through exchange or purchase. No State or private lands are located within the WSA.

The following are specific actions that would take place under this alternative:

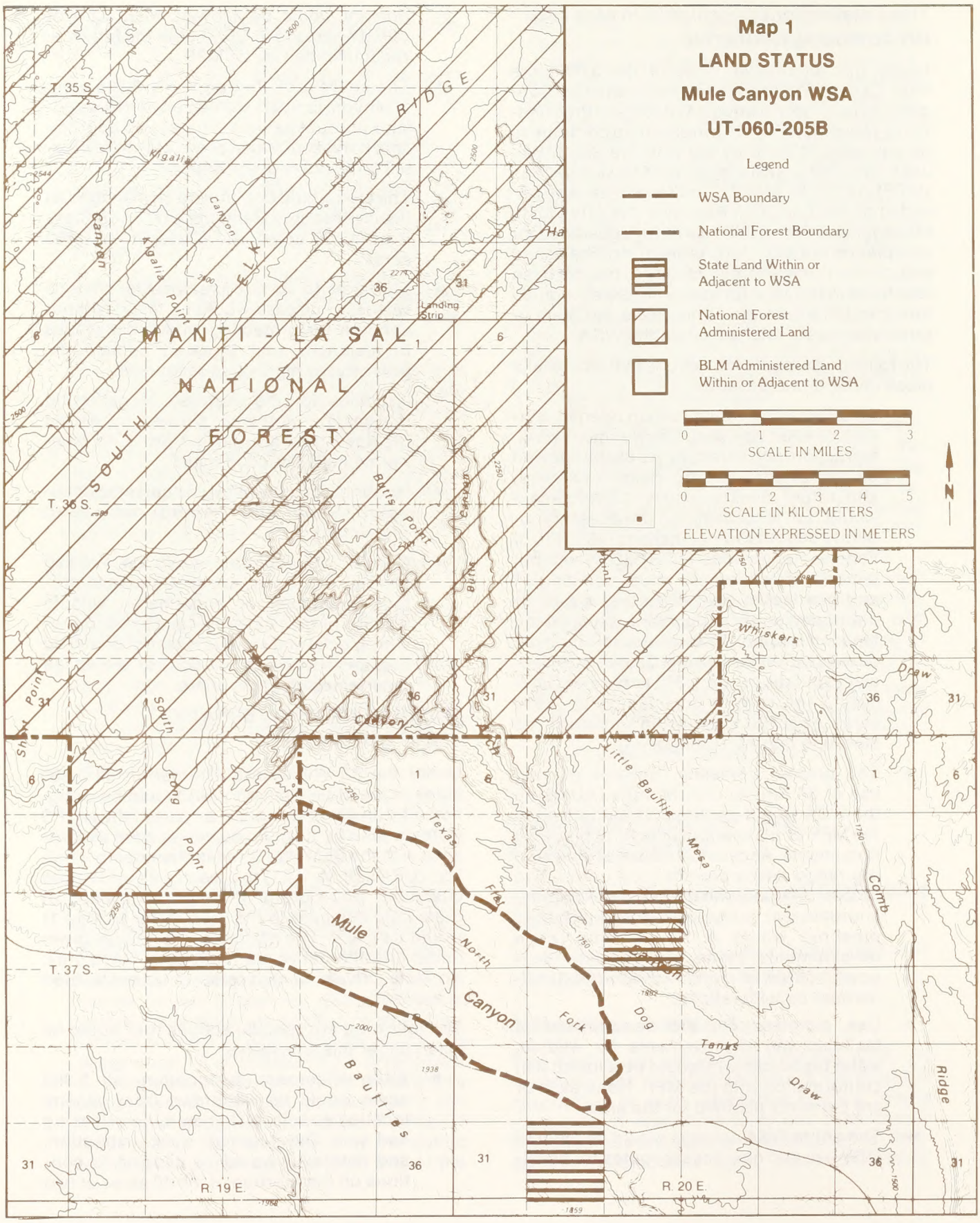
- All 5,990 acres would remain open to mineral location and sale. Development work, extraction, and patenting would be allowed on two existing mining claims (40 acres) and future mining claims. Development would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases on 5,590 acres could be developed under stipulations issued at the time of leasing. Future leases could be developed under leasing Category 2 (special stipulations) on 1,350 acres and Category 3 (no surface occupancy) on 4,550 acres. About 90 acres would continue to be closed to leasing (Category 4).
- The present domestic livestock grazing use of 37 Animal Unit Months (AUMs) in the WSA would continue as authorized in the MFP or other applicable BLM planning documents. Access to and use of the existing range developments (one corral, two fences, one gate, and the Dog Tanks Spring improvement, including 700 feet of buried pipeline) would continue. New range developments (none are currently proposed) could be implemented without wilderness considerations.
- Use, maintenance, and development of facilities and improvements for wildlife, water resources, etc. could be allowed if in conformance with the MFP. None exist or are currently planned for the area.
- The entire WSA acreage would be open to ORV use and new access routes for development would be allowed. Mule Canyon could be closed to ORV use in the future, as recommended in the MFP.
- The entire area (but primarily 3,395 acres of pinyon-juniper) would be open to woodland product harvest. There is no appreciable harvest of forest products at the present time, nor is any planned.
- The area would continue to be managed as Visual Resource Management (VRM) Class II on 4,130 acres and Class III on 1,860 acres.
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

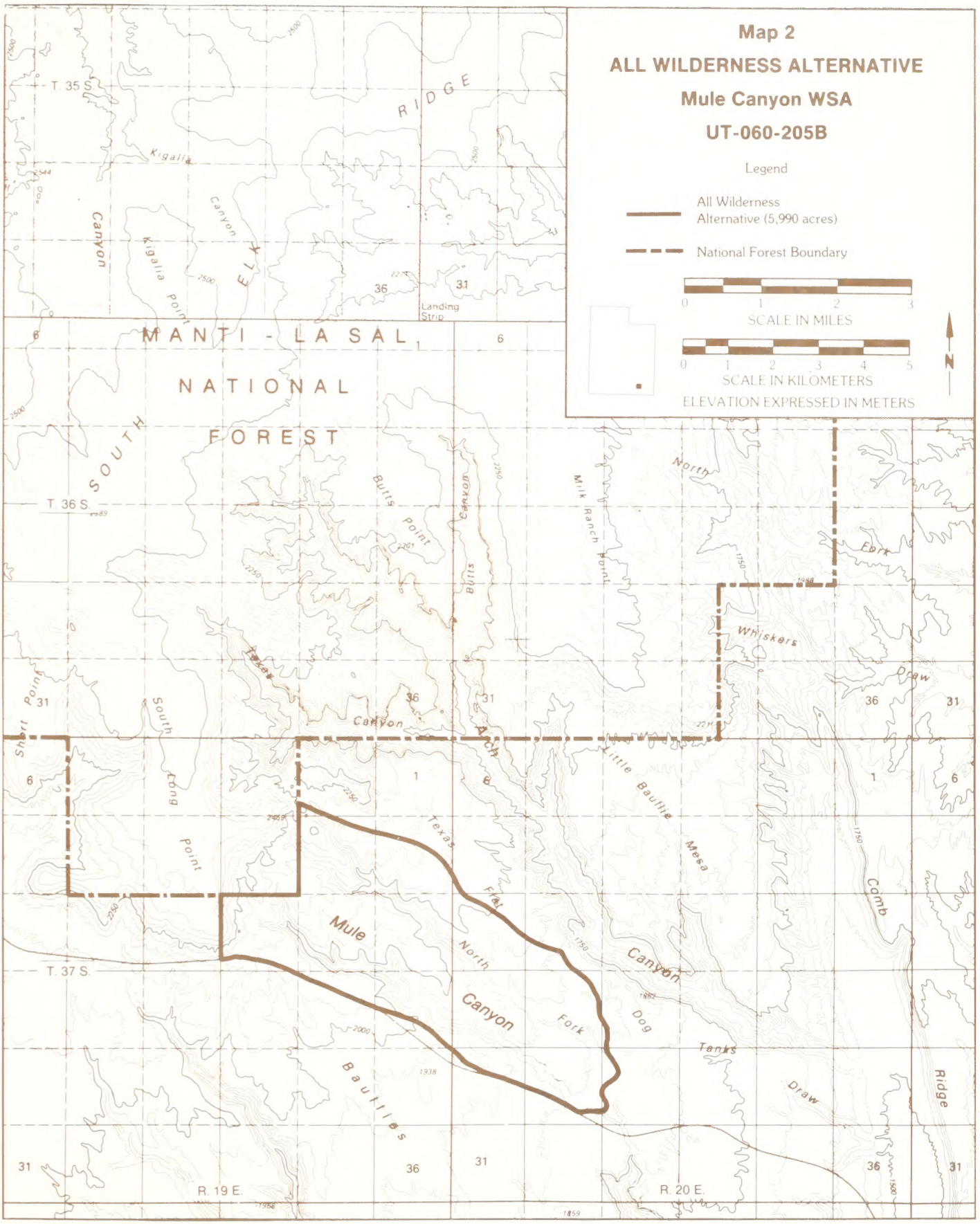
ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under the All Wilderness Alternative, all 5,990 acres of the Mule Canyon WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. Upon designation, no acquisition of State land adjacent to the WSA (refer to Map 1) would be likely. The figures and acreages given under this alternative are for Federal lands only. No State, private, or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 5,990 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the 40 acres of two


Map 1
LAND STATUS
Mule Canyon WSA
UT-060-205B
Legend
WSA Boundary
National Forest Boundary
State Land Within or Adjacent to WSA
National Forest Administered Land
BLM Administered Land Within or Adjacent to WSA
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
MANTI - LA SAL NATIONAL FOREST
SOUTH
T. 35 S.
T. 36 S.
T. 37 S.
R. 19 E.
R. 20 E.
RIDGE
ELK
Kigalia Canyon
Kigalia Point
Landing Strip
Burts Point
Burts Canyon
Short Point
South Long Point
Texas Canyon
Texas Flat
North Fork
Mule Canyon
Baullies
Little Bauble Mesa
Whiskers Draw
Dog Tanks Draw
Ridge
36
31
6
1


Map 2
ALL WILDERNESS ALTERNATIVE
Mule Canyon WSA
UT-060-205B
Legend
All Wilderness Alternative (5,990 acres)
National Forest Boundary
SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
MANTI - LA SAL NATIONAL FOREST
SOUTH
T. 35 S.
T. 36 S.
T. 37 S.
R. 19 E.
R. 20 E.
RIDGE
Kigalia Canyon
Kigalia Point
ELK
Landing Strip
Burts Point
Canyon
Milk Ranch Point
North Fork
Whiskers Draw
Texas Canyon
Short Point
South Long Point
Little Baullie Mesa
Camb Ridge
Mule Canyon
North Fork
Flat
Dog Tanks Draw
Baullies

existing mining claims that may be determined to be valid, and on any other valid claims that may be located prior to designation. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809), with consideration given to wilderness values. Existing oil and gas leases, involving 5,590 acres of the WSA, would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.

- Present domestic livestock grazing would continue as authorized in the South San Juan MFP until that plan is superseded by the San Juan Resource Area RMP scheduled for completion in 1986. The 37 AUMs in the WSA would remain available to livestock as presently allotted. The use and maintenance of range developments existing at the time of designation (as listed under the No Action Alternative) could continue in the same manner as in the past based on practical necessity and reasonableness. After designation new range developments would be allowed on a case-by-case basis if necessary for range and/or wilderness resource protection and management, as long as standards to protect wilderness values are met (refer to Appendix 1). No new range facilities are now proposed.
- New water resource failities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are located in the Mule Canyon WSA, and none are currently planned.
- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values, as long as criteria to protect wilderness values (refer to Appendix 1) are met. No wilderness developments are existing or planned in this WSA.
- The entire 5,990-acre area would be closed to ORV use except for: (1) users with valid existing rights if approved by BLM in accordance with 43 CFR rules; or (2) for occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. About 0.3 mile of existing vehicular ways in the WSA would not be available for vehicular use except as indicated above. About 11 miles of roads (including 6 miles of State Highway 95), which form part of the boundary of the WSA, would remain open to vehicular use.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 5,990-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pinyon nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is minimal harvest of forest products at the present time, and none is specifically planned.
- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resource. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.

- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Air Quality

The WSA has a Prevention of Significant Deterioration (PSD) Class II air quality classification in accordance with the Clean Air Act, as amended. The WSA is within the Four Corners Interstate Air Quality Control Region, which includes several coal-fired powerplants. However, none of the powerplants are within 100 miles of Mule Canyon. The air quality is good over the WSA. The nearest Class I air quality area is Canyonlands National Park some 32 air miles north of the WSA. However, the Abajo Mountains lie between the two areas isolating them. Visual range in the general vicinity averages between 100 to 132 miles during the summer (Aerocomp, Inc., 1984).

Geology

The WSA is entirely within the Colorado Plateau Physiographic Province. This province straddles the Four Corners region. The WSA is within the Canyonlands section, the most rugged and least accessible section of the province. The many canyons are precipitous, escarpments separate dry plateaus, and erosion has produced picturesque buttes, arches, and natural bridges.

Mule Canyon lies along the broad eastern limb of the Monument Upwarp, a major north-trending structural division of the Colorado Plateau. Surface geology consists of flat-lying beds of the Cedar Mesa Sandstone Member of the Cutler Formation of the Permian Age.

Two forks of Mule Canyon run roughly parallel through the unit. Between them is a sloping plateau with elevations that vary from 7,600 feet in the northwest to 6,000 feet in the southeast.

The Cedar Mesa is typically a white, fine-grained, calcareous, and cross-bedded sandstone. It was originally interpreted as an eolian deposit, primarily on the basis of its large-scale cross-stratification. Recent examination of the formation now indicates that it represents a near-shore shallow marine deposit that has been transported into the area by long shore currents from the northwest. The Cedar Mesa Sandstone interfingers eastward with the Cutler Formation.

The Cedar Mesa Sandstone is underlain in this area by the Halgaito Shale, a westerly tongue of Cutler red beds that grades northwesterly into the marine Elephant Canyon Formation. Typically the Halgaito consists of reddish-brown thin-bedded shaley siltstone and very fine-grained, silty sandstone. Some stratigraphers place the red shales (Halgaito) directly underlying the Cedar Mesa Sandstone into the Rico Formation. The Rico Formation was originally described as a gradational sequence gradually changing upward from the Marine Strata of Pennsylvanian Age to continental red beds of Permian Age above. In the vicinity of Mule Canyon the entire Halgaito has been mapped as Rico. This would include all the sections between the Permo-Pennsylvanian unconformity and the Cedar Mesa Sandstone.

All of the Moenkopi Formation of Triassic Age has been eroded from the WSA.

Soils

The majority of the WSA consists of shallow soils and rock outcrop on the ledges, rims, and surface of the mesa above Mule Canyon. Small areas of very deep loamy soils occur on the surface of the mesa in concave slope positions and basins. Moderately deep and deep loamy soils, some of which are extremely stony and bouldery, occur on steep and very steep fans in the forks of Mule Canyon and below South Long Point. Deep and very deep alluvial soils occur along the Mule

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
MULE CANYON WSA

Resource	Alternatives	
	No Action	All Wilderness (5,990 Acres) (Proposed Action)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil and 18 billion cubic feet of natural gas.	Oil and gas likely would not be recovered. Due to the low likelihood of recovery of oil and gas, however, the loss of development opportunity would not be significant.
Wildlife	About 2.7 percent of the WSA could be affected by energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.
Livestock	Grazing of 37 AUMs and maintenance of existing developments would continue. New developments could be constructed; however, none are now proposed.	Grazing of 37 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. If proposed, new developments might not be allowed.
Visual Resources	The quality of visual resources could be impaired on up to 160 acres.	Impairment of visual quality would not be expected.
Recreation	ORV use would continue on 0.3 miles of way at current low levels. Overall recreational use could increase from the current 240 visitor days per year to 358 over the next 20 years. Up to 160 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including 0.3 miles of way, would be closed to ORV use. Primitive recreational use could increase due to publicity associated with wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 160 acres (2.7 percent of the WSA), but the values in the rest of the WSA would not be affected.	Wilderness values would be protected, as oil and gas leases would expire and no development would occur.
Land Use Plans and Controls	This alternative would be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the BLM South San Juan MFP.	This alternative would not be consistent with the San Juan County multiple use concept. It would be consistent with State policy, as State lands would not be affected. Designation would constitute amendment of the BLM South San Juan MFP or the forth-coming 1986 San Juan RMP.
Socio-economics	Annual local sales of less than $1,634 and Federal revenues of up to $16,822 would continue. An additional $930 per year in Federal revenues could be derived from leasing of presently unleased areas.	Annual local sales of less than $1,634 and Federal revenues of up to $52 could continue, but Federal revenues of up to $17,700 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Types	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Bare Soil Surface
Rock Outcrop	15	897	0	0
Shallow loamy soils on sloping structural benches and ledges	30	1,798	1	5
Deep loamy soils on gently sloping structural benches	20	1,198	0.1	1
Shallow and deep stony soils on steep canyon side	35	2,097	1	10

Source: Hansen, 1985.

Canyon drainages. Table 2 gives soil characteristics and land types for Mule Canyon WSA.

Under present conditions, soil losses from water erosion are expected to average 0.67 cubic yards/acre/year. Greatest losses are on the steep and very steep fans in Mule Canyon and below South Long Point.

Table 3 summarizes soil erosion conditions for the WSA.

Vegetation

Existing vegetation types for the WSA are summarized in Table 4.

TABLE 4
Existing Vegetation Types

Existing Vegetation Types	Acres	Percent of WSA
Pinyon-Juniper	3,395	56.7
Sagebrush	50	0.8
Riparian	30	0.5
Barren (slickrock)	2,515	42.0
Total	5,990	100

Source: USDI, BLM, 1970

The pinyon-juniper type consists of mature trees up to 15 feet in height with an interspacing of 12 to 15 feet and a sparse understory. Understory species include sagebrush, Mormon tea, buffalo berry, cedar weed, serviceberry and mahogany.

The sagebrush type consists of big sagebrush approximately 2 feet in height with an interspacing of 3 feet and very little understory species. Understory includes bottlebrush, squirreltail, and annuals such as cheatgrass.

The slickrock-waste acres primarily include the canyon bottoms and slopes. This type includes

TABLE 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/acre year)	Annual Soil Loss Under Present Conditions: Percent of Area	Acres	Cubic Yards	Annual Soil Loss if Disturbed: Percent of Area	Acres	Cubic Yards
Very High	20	-	0	-	-	-	-
High	10	-	0	-	35	2,096	20,960
Medium	5	-	0	-	30	1,797	8,985
Low	1	65	3,893	3,893	20	1,198	1,198
Very Low	0.1	20	1,198	119	-	-	-
None	0	15	899	0	15	898	0
Totals				4012[1]			31,143[1]

Source: Hansen, 1985

[1]Average annual soil loss in cubic yards per acre: 0.67 under present conditions; 5.19 if disturbed.

some dense vegetation as well as areas of bare sandstone and sparse vegetation. Vegetation includes pinyon-juniper, rabbitbrush, mahogany, and serviceberry as well as some Douglas fir. The Douglas fir occurs primarily on the north slopes of the canyons and in isolated pockets along the west side of the unit.

The canyon bottoms include approximately 13 miles of riparian area (approximately 30 acres) that includes species such as cottonwood, rabbitbrush, and sagebrush.

There are no known threatened or endangered plant species in the WSA. *Astragalus cottamii*, a sensitive species currently being reviewed by the Fish and Wildlife Service (FWS) for possible listing as threatened or endangered, may occur in the WSA.

The Mule Canyon WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) types of the WSA are juniper-pinyon woodland and pine-Douglas fir, as listed on Table 5. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 5
Potential Natural Vegetation Types

PNV Types	Acres	Percent of WSA
Juniper-pinyon woodland	4,500	76
Pine-Douglas fir	1,490	24
Total	5,990	100

Source: USDI, Geological Survey, 1978.

Water Resources

There are no reservoirs or natural water sources in the Mule Canyon WSA. Dog Tank Spring, which was developed for livestock, is located along the eastern boundary of the WSA. Runoff is temporarily retained in slickrock tanks. Water quality is good. No water developments are proposed in the WSA.

Mineral and Energy Resources

The BLM, in consultation with the U.S. Department of Energy (DOE), had each WSA within Utah independently assessed for its energy and mineral resources by SAI (1982). Refer to Appendix 5 for a detailed description of the SAI rating system.

An overall importance rating (OIR) of 1+ was assigned to the Mule Canyon WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. Shades of importance are indicated by + or -. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA. The energy and mineral resource rating summary is given in Table 6.

If the WSA is recommended as suitable for wilderness designation, its mineral importance of the WSA will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report for the WSA. Reports will be made available to the public and will be submitted to the President and Congress as required by the FLPMA. BLM and the Secretary of the Interior will also consider the reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. No minerals currently listed as strategic and critical are

TABLE 6
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil	f2	c2	Less than 10 million barrels;
Gas	f2	c2	Less than 60 million cubic ft.
Uranium/ Vanadium	f1	c1	None
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydroelectric	f1	c4	None
Copper	f1	c1	None
Manganese	f1	c1	None
Potash	f1	c3	None

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

found within the Mule Canyon WSA (Federal Emergency Management Agency, 1983).

LEASABLE MINERALS

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and development than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

Most of the area (5,590 acres) has been leased. Nine (2,180 acres) of the existing leases are pre-FLPMA and nine (3,410 acres) are post-FLPMA. Oil and gas leasing categories were established for the area as follows: Category 2 (special stipulations), 1,350 acres; Category 3 (no surface occupancy), 4,550 acres; and Category 4 (closed to leasing), 90 acres. This protective categorization was designed to protect the aesthetic, watershed, and cultural values of the area.

No oil and gas wells have been drilled within the WSA, but six exploratory wells have been drilled nearby. Although all wells in the area have been abandoned, some reportedly had oil shows and stains in the lower part of the Paradox Formation. The bulk of the wells was drilled in the late 1950s and early 1960s to depths generally less than 4,000 feet. The dominant structural monocline, the Elk Ridge anticline, has been drilled west and south of the WSA to depths between 3,100 and 3,700 feet; all the wells were reportedly dry.

Despite the favorable stratigraphy in the vicinity of the WSA, broad uplifts beginning in late Cretaceous time have significantly lowered the oil and gas potential of the Paradox Formation in this area. As a result of this uplift, erosion has stripped away overlying Mesozoic sedimentary rocks across most of the Monument Upwarp. Within the WSA the Paradox Formation is probably less than 1,000 feet below the surface. About 40 miles south most or all of the Paradox Formation is exposed along canyon walls along the San Juan River. In addition, Pennsylvanian rocks are exposed about 30 miles to the north in Dark Canyon. It is, therefore, very unlikely that reservoir pressure exists in Pennsylvanian rocks throughout much of this area; it almost certainly does not exist in this WSA. If oil and/or gas existed in the Paradox Formation in this area, there is a good chance that it has drained away.

On the basis of the discussion above, Pennsylvanian and Permian rocks in the WSA probably do not contain large reserves of oil and/or gas. On the other hand, small accumulations that were effectively sealed from drainage into the San Juan River may still exist in Pennsylvanian rocks underlying the WSA. The oil and gas potential is rated as low (less than 10 million barrels of oil and 60 billion cubic feet of gas in-place, with up to 3 million barrels of oil and 18 billion cubic feet of gas considered recoverable). No other leasable minerals are known to occur in the WSA. Appendix 6 provides estimates of recoverability.

LOCATABLE MINERALS

There is a minimum amount of mineral exploration and development in the WSA. There were only two mining claims (totaling less than 40 acres) of record as of May 1982 in the WSA. They are located along the east boundary near Texas Flat. Both mining claims do not have current assessment recorded.

The principal uranium, copper, and manganese bearing units on the Colorado Plateau, the Morrison Formation of Jurassic Age and the Chinle Formation of Triassic Age have been removed from the WSA by erosion. Of the formations preserved in the WSA, only the Cutler Formation has been productive for uranium elsewhere in the Moab District (at Lisbon Valley). The Cutler Formation in Mule Canyon, however, is not considered favorable for uranium or vanadium because it contains no known uranium anomalies in this area, as well as very little organic carbon and mudstone.

Other locatable minerals such as lead, zinc, and silver are essentially absent from the sedimentary units of the Colorado Plateau except in areas of igneous intrusion.

Wildlife

There are a few resident mule deer. The Mule Canyon WSA is a transition zone along a deer migration route that is used primarily during the fall and spring months. Mountain lion also utilize the WSA. Cottontail rabbits, white-tailed antelope squirrel, chipmunk, deer mice, and assorted bats are found throughout the WSA.

There is no waterfowl habitat in the WSA. No raptor nesting sites have been identified. The greatest diversity of passerine bird species is found in the canyons during the spring migration. Great horned owl, Cooper's hawk, hairy woodpecker, ash-throated flycatcher, violet-green swallow, common raven, pinyon jay, titmice, rock wren, mountain bluebird, and mourning dove are the most common bird species.

The side-blotched lizard, northern plateau lizard, northern sagebrush lizard, and Great Basin gopher snake are the most abundant species in the WSA. There are no fish species in this portion of Mule Canyon.

Bald eagles may be transients through this area. However, the FWS has not identified any threatened or endangered wildlife species in this area. There is no critical habitat identified in the WSA nor is any development or treatment for wildlife habitat proposed.

Forest Resources

A pinyon-juniper woodland occupies approximately 3,395 acres in the WSA. These are low quality sites (20 cubic feet usable wood per acre) and are considered nonproductive forest land. At the present time, pulp and papermaking opportunities are low. No areas in the WSA have been designated as Christmas tree cutting areas.

During 1981, there were 323 free-use firewood permits issued in the San Juan Resource Area, but it is unlikely that over 10 individuals gathered firewood from the WSA. Occasionally a limited quantity of fenceposts may be cut, mainly adjacent to U-95 just within the south boundary. There is estimated to be less than 530 cords of firewood in the WSA.

Occasional recreationists may have gathered pinyon nuts, but there have been no commercial gathering permits issued near this WSA.

Livestock and Wild Horses/Burros

The Mule Canyon WSA is within and encompasses about 8 percent of the Texas-Muley Grazing Allotment. Parts of two pastures, Dog Tank and Texas Flat, are included in the WSA. Table 7 summarizes allotment grazing use data.

The two pastures, including the WSA, are grazed by approximately 133 cattle from April 16 through May 31. Most of the grazing in these pastures occurs in the crested wheatgrass seedings on Texas Flat outside the boundary of the WSA.

Allowing 20 acres per AUM in the sagebrush type and 100 acres per AUM in the pinyon-juniper type, it is estimated that the WSA produces 37 AUMs of livestock forage or about 2 percent of the total forage (1,781 AUMs) produced in the allotment. Estimated grazing use in the WSA is 25 cattle for the grazing season.

Existing developments in the WSA include the Dog Tank Spring development, a vehicular way (0.3 miles), a corral, gate, and fence located along the northeast boundary, and a fence located on the National Forest boundary. No range improvement projects are currently proposed in the WSA.

Vehicular use occurs on the boundary roads and the existing way. Other than that, ORVs are rarely, if ever, used for livestock management in the WSA.

There are no wild horses or burros in the WSA.

TABLE 7
Livestock Grazing Use Data

Allotment	Season of Use	Number of Livestock In Allotment	Number of Permittees	Number of AUMs Allotment	Number of AUMs In WSA
Texas-Muley	11/15 to 5/31 12/1 to 3/31	274 Cattle 4 horses	1	1,716	37

Source: USDI, BLM, 1970.

Visual Resources

The landscape character of an area is defined as the arrangement of a particular landscape as formed by the variety and intensity of the landscape features and the four basic elements of form, line, color, and texture. These factors give the area a distinctive quality that distinguishes it from its immediate surroundings.

The character of the WSA is composed of a plateau divided by two forks of Mule Canyon. The major landforms are gently rolling to relatively flat tablelands, with exposed slickrock and two

similar canyons that drain to the southeast. The meandering canyons are relatively shallow (80 feet) in the southeast and gradually deepen (to 240 feet) in the northwest portion of the WSA. The steep canyon walls are a series of sandstone ledges or terraces that create a horizontally layered appearance. The light pink-and-gray color bands further reinforce this. The rock ledges have a smooth texture.

The vegetation on the tablelands is dense pinyon-juniper with open sagebrush parks. In the canyons, the vegetation includes cottonwood-willow along the drainages, Douglas fir-ponderosa pine in the canyon bottoms and on the north-facing slopes, and pinyon-juniper on the sandstone ledges. Colors vary from dark to light greens to gray-greens and create an interesting contrast with the sandstone. Textures are coarse to fine.

TABLE 8
Visual Resource Quality and Management Class

Element	Acres	Percent of WSA
Scenic Quality		
Class A	3,174	53
Class B	2,816	47
Class C	0	0
Management Class		
Class I	0	0
Class II	4,130	69
Class III	1,860	31
Class IV	0	0

Source: USDI, BLM, 1970.

The WSA contains both VRM Class II and Class III areas and Class A and Class B scenery. The BLM Visual Resource Evaluation System was used to rate the Mule Canyon WSA's visual characteristics, as shown in Table 8. The BLM's VRM system is explained in Appendix 7.

Cultural Resources

Most of the limited inventory work thus far conducted in the Mule Canyon area was completed by the BLM during the 1977 field season. The purpose of the inventory was to record sites and document the agents and trends of deterioration. The remaining work was primarily performed by a consultant doing cultural clearances for U.S. DOE boreholes. The overall dearth of site information from this area is a reflection of the lack of inventory work completed. Where inventories have been performed, sites have been found.

The Mule Canyon WSA contains a wealth of pristine cultural resources. A literature search revealed 37 recorded sites representing a predominance of Pueblo cultural manifestations. Most of these sites are cliff dwellings, which include habitation and/or storage structures (granaries). The remaining sites are open habitation camps on the mesa top.

There are no existing National Register sites and/or nominations in this WSA. However, based on estimates from similar settings in the area, it could be expected that up to 700 sites would be located in the WSA, of which 470 could be National Register eligible.

Recreation

Mule Canyon WSA is a relatively unknown hiking area. Several times a year rangers will complete hiking registration forms for both forks. Since registration is not required and the number of hikers is so small, rangers did not keep track of visitation data until January 1982. As of September 1982, 88 visitor use days were recorded. This is probably less than half of the actual use for hiking and backpacking. Therefore, the recreational use of the WSA is currently estimated at 240 visitor days annually. No visitor days are related to commercial outfitting (river, horses, vehicular). Nearly all of the use is attributed to primitive activities.

Hiking in Mule Canyon is relatively easy. One can enter either fork from the old U-95, which was realigned in 1976, where the canyons are shallow, and there is very little altitude gain as one proceeds up the canyon. The presence of cattle trails facilitates hiking. There are a few other access points from the new U-95 (which is 0.25 mile from the rim of the south fork), from the dirt road on Texas Flat, and down a small wash on the south rim of the north fork. These latter access points are moderately difficult; one must descend into the canyons by climbing down talus slopes. Because of the quick access from U-95, the canyons provide an excellent dayhiking location into a slickrock canyon system.

Rangers have not seen any other types of recreation use in the canyons. Motorcycle and vehicle tracks are often found along the Texas Flat road (north boundary), heading off towards the canyon. Vehicular use on 0.3 mile of an existing way is most likely in association with other activities such as hunting rather than solely for ORV purposes. The WSA is open to ORV use, but is recommended to be closed to such use in the future.

Deer hunting does not presently occur in this WSA, since Cedar Mesa has been closed to hunting for the past 3 years. However, it has been a very popular hunting area in the past. The Dog Tank Spring area (Section 20) was a well used hunting area, with estimated use at about 100 user days.

Wilderness Values

SIZE

The WSA, at 5,990 acres, meets the minimum size criterion for a WSA. The unit is approximately 5 miles long and 2.25 miles wide, lying along a northwest to southeast axis.

NATURALNESS

The majority of the unit appears predominantly natural and free of human imprints. Imprints on Texas Flat (a road, railing, and reservoir) were excluded from the WSA in the *BLM Intensive Wilderness Inventory*. The remaining imprints are all on the periphery and are so minor that they do not affect the naturalness of the WSA as a whole.

Dog Tank Spring was improved in 1971 by the installation of 700 feet of buried pipe, directing water into two metal troughs. A campsite is near this spring consisting of a short spurway from the boundary road, a small clearing, and a fire ring.

In the extreme southeast of the unit, adjacent to old U-95, is a pole-fence livestock corral.

Adjacent to U-95 is the Mule Canyon Ruins Rest Stop. This interpretive rest stop is just outside the WSA's boundary.

From the boundary road in Section 20 there is a way through the pinyon-juniper about 0.3 mile in length. Also, in a few places, vehicle tracks extend into the unit for short distances from U-95.

These imprints cover less than 1 percent of the WSA and meet the naturalness standard for areas under wilderness review. All 5,990 acres of the WSA would be considered natural in character.

SOLITUDE

The north and south forks of Mule Canyon offer outstanding opportunities for solitude because of terrain and vegetation. The two forks are each about 5 miles long, cutting 500 feet into the mesa on the west and gradually shallowing to 80 feet where they leave the WSA. The pinyon, juniper, cottonwoods, ponderosa, and Douglas fir trees combine with the topography to enhance a user's ability to find seclusion within the WSA.

The two canyons (without major side drainages) of the WSA are the main travel routes and provide only a limited number of travel locations. With increased use the opportunities for solitude would be reduced as a single party could hike both canyons in a day's time.

Sights and sounds from the adjacent U-95 limit opportunities for solitude in the WSA up to the rim of the South Fork of Mule Canyon. This area encompasses about 800 acres that do not have outstanding opportunities for solitude. North into the unit, the pinyon-juniper forest and the deep canyons prevent the highway from being an influence beyond the rim of this canyon.

In summary, in over 86 percent (5,190 acres) of the WSA the opportunities for solitude meet the outstanding criterion for areas under wilderness review. About 800 acres do not meet this criterion.

PRIMITIVE AND UNCONFINED RECREATION

The WSA offers outstanding opportunities for primitive and unconfined recreation. The deep, narrow, winding canyons offer opportunities for hiking and exploration. The scenic contrasts of the ponderosa and the Douglas fir trees against the rounded red sandstone of the canyons enhance the hiking, exploration, and camping opportunities.

Hiking in Mule Canyon offers varied levels of difficulty. In the middle and lower sections of the canyons, gravel wash bottoms and cattle trails facilitate hiking. The upper ends are more challenging, with boulders and ponderosa trees choking the narrow canyon bottoms, and rapid elevation changes.

The easy access to this WSA from U-95 on the south and Texas Flat road on the east makes the WSA's primitive recreation opportunities readily available to the public but could also detract from this experience by facilitating additional visitation.

The WSA contains two 5-mile segments of canyons that tend to channel users, limiting the unconfined nature of the recreation experience to an up-and-down canyon hiking experience.

Other opportunities for primitive and unconfined recreation include backpacking, rock climbing/scrambling, hunting (should the area be opened again to this use), exploration, nature study, and observing features of geologic and archaeological interest. All 5,990 acres meet the primitive and unconfined recreation criterion.

SPECIAL FEATURES

Special features of the Mule Canyon WSA include archaeological and scenic values.

Archaeological values are high and are of special interest to visitors of the WSA. There are 37 known Anasazi sites within the WSA, most of which are cliff dwellings. These picturesque ancient structures add an element of discovery to the enjoyment of primitive recreation in this WSA. The understanding of a past people's use of this land is an educational feature of these cliff dwellings. Adjacent to the WSA, the Mule Canyon Ruins interpretive rest stop on U-95 with its stabilized kiva tower base and room block, also provides an aid to understanding the people who once inhabited these canyons.

Additionally, over half of this WSA has Class A scenery characterized by smooth red sandstone with contrasting ponderosa pine and Douglas fir. This unique scenery adds to the enjoyment of hiking in this naturally beautiful area.

Land Use Plans and Controls

Land ownership within the WSA is entirely public lands administered by the BLM. There is one parcel of State land adjacent to the west boundary of the WSA, and the Manti-LaSal National Forest borders the north and northwest sides of the area. The forest lands are not under consideration for wilderness nor are any adjoining lands proposed as wilderness. No private or split estate lands are located in the WSA.

Dog Tank Spring, located on the east WSA boundary, was withdrawn as a public water reserve. The withdrawal review has been completed and it has been recommended that the withdrawal be continued. The withdrawal is intended to protect and preserve bodies of water, springs, and water sources for public use. Valid and legitimate purposes for which water is reserved include stockwatering, human consumption, agriculture, and use by fish and wildife, including their habitat. Dog Tank Spring has been developed within the withdrawal to provide water for livestock.

There are no land use permits, leases, or licenses in the area.

U-95 forms the south boundary of the WSA and provides the public access to the WSA. There are some minor livestock trails used by hikers.

The *San Juan County Master Plan* (Planning and Research Associates, 1963) recommends the area as open range and forest land. This plan predates wilderness considerations; however, the San Juan County Commission opposes any wilderness areas being legislatively or administratively designated in the County (San Juan County Commission, 1980).

The WSA is located in the BLM San Juan Resource Area. Land use planning is governed by the South San Juan MFP (USDI, BLM, 1971) which is scheduled for replacement by the San Juan Resource Area RMP in 1986. Current management has favored multiple use as described in the No Action Alternative. Important features of the MFP include leaving the area open to mineral location and sale with certain restrictions; continuing domestic livestock grazing, harvest of forest products, and Class II and III VRM management; and evaluating the WSA for possible primitive values.

Socioeconomics

DEMOGRAPHICS

The WSA lies in central San Juan County. The nearest community is Blanding, approximately 30 miles away. The socioeconomic effects of designation or nondesignation would be confined mostly to San Juan County. The character of the county can be summarized as rural and sparsely populated. Even though local employment in the mining industry decreased by 20 percent between 1980 and 1982, due to a downturn in local uranium mining and milling, the mining industry still remains the largest local private employer (Utah Department of Employment Security, 1983).

San Juan County had a 1982 population of 12,700, not quite 1 percent of the State population (U.S. Department of Commerce [USDC], Bureau of the Census, 1981). County population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers: Monticello, the county seat, had a 1980 population of 1,930 and Blanding had a 1980 population of 3,120 (USDC, Bureau of the Census, 1981).

San Juan County is one of the largest counties in Utah, comprising 7,885 square miles (about the size of New Jersey). About 86 percent of the county is owned by the Federal Government, 6 percent by the State of Utah, and 8 percent by private land owners. The southern quarter of the county is included in the Navajo Indian Reservation.

EMPLOYMENT

Mining directly accounts for half of the income and about 32 percent of the employment in the county (refer to Table 9). Because the mines and mine employees both purchase products locally, mining's total local importance is even greater.

Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are on welfare and are, therefore, not included in unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

TABLE 9
1981 Wage and Salary Employment and Income
San Juan County, Utah

	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance and Real Estate	1	1
Services	8	11
Other	-	-
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total	98	96
Unemployment (First Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

Note: Because of rounding, numbers are not additive. Employment percentage figures include only wage and salary employment. The relative importance of farm employment is therefore underrated. Tourism is included as part of services, retail trade, and other services.

INCOME AND REVENUES

Past activities in the WSA that could be of some local economic consequence include livestock production, hunting, and dispersed nonmotorized recreation. Table 10 summarizes local income and Federal revenues from the WSA. Appendix 9 identifies the multipliers used to estimate income and revenues.

One livestock operator has grazing privileges in the WSA. Based on the consumption of 37 AUMs of forage by cattle, it is estimated that the WSA accounts for $750 of livestock sales, including $300 of ranchers' returns to labor and investment.

TABLE 10
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Mining Claim Assessment	$200 if current	None
Oil and Gas Leases and Production	None	$16,770
Livestock Grazing	$750	$52
Recreational Use	Less than $984	No commercial permits
Total	Less than $1,634	Up to $16,822

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total income that would be generated by these expenditures.

The WSA was a popular hunting area in the past. Although there are no use statistics for the WSA itself, hunter-related expenditures were well distributed among businesses in the county and were locally insignificant.

The WSA's nonmotorized and motorized recreational use is low and related local expenditures are low and insignificant to both the local economy and individual businesses. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1981). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for the Mule Canyon WSA is estimated as about 240 visitor days per year (almost all primitive-type recreation). Only a portion of the $984 of expenditures for recreational use of the WSA contributes to the local economy of San Juan County.

No oil and gas or mineral production has occurred in the WSA. Therefore, mineral and energy resource production from the WSA has not contributed to local employment or income. The WSA has two mining claims (of which neither is current in assessment work). Regulations require a $100 annual expenditure per claim for labor and improvements, an undetermined part of which is spent in the local economy.

Some woodland products are harvested from the WSA; however, the harvests have been small and are insignificant to the local economy and only of mninor significance to those involved in the harvest.

The WSA generates revenues to the Federal treasury from two sources: grazing and mineral leasing. Within the WSA, about 5,590 acres are

currently leased for oil and gas. At $3 per acre, this annually generates about $16,770 in Federal revenues. Half of this, about $8,385, is allocated to the State of Utah. The State then reallocates these revenues to various funds, the majority of which are related to energy development. How much, if any, is distributed to the local level is not known. Based on 37 AUMs of forage consumed by livestock in the WSA, with the current annual grazing fee of approximately $1.40 per AUM, the WSA annually accounts for about $52 of grazing fee Federal revenues. Half of this is allocated back to the local BLM district for construction of range improvement projects.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Futures users in the WSA would meet requirements of all applicable Federal, State, and local permits.

3. Designation of the area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from: (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could likely occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown but would probably be low due to the WSA's rough terrain and low resource potential. The following is a worst-case analysis based on the assumption that oil or gas would be developed sometime in the future resulting in 160 acres of surface disturbance. (Appendix 10 lists surface disturbance assumptions and estimates.) No surface disturbance related to development of other mineral resources is anticipated.

AIR QUALITY

The WSA would continue to be managed as a PSD Class II area. Disturbance of 160 acres would result in minor temporary increases in fugitive dust emissions. Because no major sources of air pollutant emissions are proposed in the vicinity of the WSA, air quality would remain essentially as at present.

GEOLOGY

No impacts to geology are expected because oil and gas exploration and development activities would probably not exceed 160 acres and would involve surface disturbances and widely spaced wells that would not change the geologic structure of the area.

SOILS

It is estimated that up to 160 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.67 cubic yards/acre/year. Soil loss on the 160 disturbed acres would increase from 107 cubic yards/year to 830 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 723 cubic yards (18 percent) over the current annual soil loss of 4,012 cubic yards to approximately 4,735 cubic yards per year.

VEGETATION

Because only 160 acres would be disturbed by mineral and energy exploration and development, no major changes in any of the vegetation types in the WSA would occur. *Astragalus cottamii*, a sensitive plant species currently being reviewed by the FWS for possible listing as threatened or endangered, may be found within or near the WSA. Before authorizing surface-disturbing activities (160 acres potential) the BLM would conduct site-specific clearances of the potentially disturbed areas. If this species could be affected, the BLM would initiate informal consultation with the FWS as required by BLM policy. The BLM could request a biological opinion when appropriate (refer to Appendix 4). Because necessary measures could be taken to protect this species, it can be reasonably concluded that the viability of populations of the sensitive plant species *Astragalus cottamii* would be preserved under the No Action Alternative.

WATER RESOURCES

Since precipitation is low and there are no naturally occurring surface water sources within the WSA, no significant sedimentation or change in total dissolved solids (TDS) is expected to occur from as much as 723 cubic yards of annual soil loss from surface disturbance. Oil and gas exploration and development in the area would generally be confined at or near the surface or with widely spaced wells and would not significantly change ground water quality or quantity. The high water quality of the Dog Tanks Spring would not be affected. Opportunities for future water developments exist under this alternative, but none are planned in the current MFP.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

The potential for up to 10 million barrels of oil and up to 60 billion cubic feet of natural gas (in-place) exists within the WSA. Up to 3 million barrels of oil and 18 billion cubic feet of gas would be recoverable. These oil and gas resources could be explored and developed, subject to Category 2 (special stipulations) on about 1,350 acres and Category 3 (no surface occupancy) on about 4,550 acres. Approximately 90 acres would continue to be closed to leasing. Because most of the area would be managed as no surface occupancy, the operator's ability to explore and develop the area would be limited. Approximately 160 acres of surface disturbance would take place if exploration and development were to occur. Due to the small size of these deposits as well as the restrictive stipulations over the area, significant production is not expected under this alternative.

Locatable Minerals

The entire WSA would remain open to mining claim location. Development of the existing two mining claims (40 acres) would not be restricted by wilderness constraints. However, no locatable mineral deposits are projected to occur in this WSA, and therefore no disturbance would likely occur from exploration and development.

WILDLIFE

As much as 160 acres of surface disturbance could occur from oil or gas exploration under this alternative. Mobile animals such as mule deer would leave the area of disturbance and less mobile animal populations would be reduced during the time of disturbance. There would be no impacts to threatened or endangered animal species under this alternative because none are present within the WSA. There are also no critical or crucial habitats that could be affected. Wildlife transplants into the WSA would be allowed; however, none are proposed or likely to occur in the foreseeable future.

Vegetation manipulation projects or water developments to benefit wildlife would be allowable under this alternative, although no need for such improvements has been identified, and it is unlikely that any improvements would ever be developed for wildlife in this WSA.

FOREST RESOURCES

Harvest of the woodland products in this WSA would be allowed under this alternative, but probably would not exceed current low levels of use due to limitations on resource potential and the topographic restraints on access as well as the availability of the resource elsewhere. As in the past, future use would continue to occur adjacent to U-95 just within the southern boundary of the WSA.

LIVESTOCK

Domestic livestock grazing would continue as authorized (currently 37 AUMs, 1 permittee) in the South San Juan MFP or other applicable planning documents. Existing range developments (one fence, corral, and developed spring) could be used and maintained as in the past. Additional roads or livestock developments could be allowed in the future without regard for wilderness values, although none are currently planned. Few, if any, changes in livestock use or management techniques are expected under this alternative.

VISUAL RESOURCES

Under this alternative, visual quality in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., 90 acres would be closed to oil and gas leasing, 4,550 acres would be managed as no surface occupancy, and 4,130 acres would be managed under VRM Class II objectives requiring that activities not be apparent).

Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual values in areas affected by the estimated 160 acres of surface disturbance from oil or gas activities would be degraded, and VRM Class II management objectives would probably not be met in disturbed areas during the short term. After rehabilitation, visual resources would be restored to meet VRM Class II and III objectives. Even after mitigation and rehabilitation, some permanent localized degradation could result. Because of leasing stipulations, roads, vehicular ways, and drill pads would be limited to certain areas and visual quality would not be significantly reduced in the area as a whole. The probability of extensive energy and mineral exploration and development is low.

CULTURAL RESOURCES

Disturbance of 160 acres (including additional roads and ways for motorized access) resulting from oil or gas exploration and development under this alternative has the potential to adversely affect cultural sites. However, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would lessen impacts. Also, surface disturbance would be limited to the 1,350-acre area managed as leasing Category 2 and would not occur throughout the WSA, so cultural values would be largely protected. Still, some of the 37 recorded and 700 potential sites (470 of which could be potentially National Register eligible) could be foregone. Vandalism of sites would be expected to increase in proportion to the general visitor increase, as well as any increase in roads from energy exploration. Experience in other portions of the Cedar Mesa area indicates a direct correlation between between additional access and sites vandalized for illegal artifact collection purposes.

Cultural site stabilization efforts and excavation could be completed without regard for wilderness considerations and would, therefore, be easier to conduct under this alternative.

RECREATION

Primitive recreational opportunities and quality would be diminished on the 160 acres disturbed by mineral and energy activities. Disturbance would be largely limited to the 1,350-acre area that would be managed as leasing Category 2 (special stipulations). Roads and ways created for mineral exploration and development would improve access into the area for nonprimitive recreation. The approximately 0.3 mile of an existing vehicular way as well as new access roads and ways from energy exploration would provide vehicular access for hunting (not currently allowed) and other nonprimitive recreational uses.

The future increase in recreational use of the WSA is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use is expected to increase from 240 current visitor days per year to 358 visitor days at the end of 20 years. Primitive recreational use would constitute nearly all of the estimated increase from the estimated current use. Recreational activities utilizing vehicular access (hunting, sightseeing etc.), which is currently almost nonexistent, would increase only slightly unless deer hunting is allowed once again; however, there are no current plans to restore deer hunting in the area. ORV activity would increase only slightly due to a limited area suitable for ORV use. Commercial outfitting would not be a factor in the area.

WILDERNESS VALUES

None of the Mule Canyon WSA would be designated wilderness, and management would continue to be under the existing South San Juan MFP until superseded by the San Juan Resource Area RMP. Wilderness values in this WSA (i.e., naturalness, outstanding opportunities for solitude and primitive recreation, and special features including cultural and aesthetic values) would be lost or diminished in affected areas (a total of 160 acres) during the time of exploration and development. The wilderness values in the area as a whole would probably not be lost because disturbance from oil or gas development would be limited to the 1,350-acre area that would be managed as leasing Category 2 (special stipulations) and would not occur throughout the area.

Although mineral location could occur, no development is likely due to the lack of locatable mineral resources in the area. Possible disturbance from future range developments could occur, although no range developments are currently planned. Motorized use of the area would impact solitude and primitive recreation opportunities mainly along the WSA's southern boundary.

LAND USE PLANS AND CONTROLS

This alternative is based on implementation of the BLM South San Juan MFP and the forthcoming San Juan RMP and, therefore, would be consistent with these plans. The withdrawal for public water reserves would continue to protect Dog Tank Springs for stockwatering use. Implementation of this alternative would be consistent with the *San Juan County Master Plan* because land use would continue as at present. No State lands are located in the WSA; therefore, no State land use plans would be affected.

SOCIOECONOMICS

Overall, no changes in existing patterns or trends of population, employment, or distribution of local income would be expected.

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the potential oil and gas resource in the WSA were developed it would lead to increased employment and income for San Juan County. However, the probability of economic development of minerals within the WSA is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the existing grazing use (37 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase only 118 visitor days per year over the next 20 years and overall recreation-related expenditures average $4.10 per visitor day (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA would likely not be significant to the local economy.

Federal and State revenues would not be reduced by this alternative. There are 310 acres in the WSA open to oil and gas leases that are currently not leased. If leased, they would bring up to $930 additional Federal lease fee revenues per year.

Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees (approximately $1.40 per year) would continue.

All Wilderness Alternative (5,990 Acres) (Proposed Action)

As cited in the Description of the Alternatives section, the major changes that could occur in the 5,990-acre area would be related to withdrawal from mineral location and closure to new mineral leasing and sale. The entire area would be placed in oil and gas leasing Category 4 (closed to leasing). About 0.3 mile of existing vehicular way in the WSA would be closed to vehicular use except for approvals by BLM, as noted in the Description of the Alternatives section. The WSA would be managed under VRM Class I.

For the following analysis, it is assumed that the existing mining claims would not be explored and developed because of a lack of locatable mineral potential. It is also assumed that the existing oil and gas leases would expire before production of commercial quantities and that oil and gas leases would not be renewed or future leasing of oil and gas allowed. Appendix 10 lists surface disturbance assumptions and estimates for the WSA.

Because potentially disturbed areas would be smaller than under the No Action Alternative (0 vs. 160 acres), anticipated impacts to air quality, geology, water resources, and wildlife for the All Wilderness Alternative would be less than those described for the No Action Alternative. Wilderness designation would provide additional protection to these resources. Other effects on these resources due to changes in management are addressed below.

SOILS

The soil resource would benefit under the All Wilderness Alternative because of the reduced likelihood for surface-disturbing activities, which are not anticipated under this alternative. Soil loss from erosion could be expected to continue at current rates (4,012 cubic yards annually) within the WSA. This is 723 cubic yards per year (18 percent) less soil loss than under the No Action Alternative.

VEGETATION

Inadvertent disturbance of *Astragalus cottamii*, a

sensitive plant species, would not occur under implementation of this alternative.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Although nearly all of the WSA is under oil and gas lease (2,180 acres of existing leases are pre-FLPMA and 3,410 acres are post-FLPMA), no exploration or development of oil and gas is presently occurring within the WSA.

Existing pre- and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases will be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases will not be reissued. Exploration for and development of a potential recoverable resource of less than 3 million barrels of oil or less than 18 billion cubic feet of natural gas would be foregone under this alternative. However, due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities, it is concluded that this alternative would not result in any significant loss of potential oil and gas recovery.

Locatable Minerals

Approximately 40 acres are under mining claims within the WSA. Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation unnecessary or undue degradation guidelines. However, no locatable mineral is projected to occur in the Mule Canyon WSA and, therefore, no disturbance would likely occur from exploration and development. After designation, all lands in the WSA (including claims not determined valid) would be closed to mineral entry (USDI, BLM, 1981).

Because production of these metals is not currently occurring and the area has no potential for locatable minerals, implementation of this alternative would not result in a significant impact to locatable mineral recovery on a local, regional, or national level.

FOREST RESOURCES

Under this alternative, no woodland harvest would occur. The potential harvest of the estimated 530 cords of fuelwood in the Mule Canyon WSA would be foregone with wilderness designation. This would not be a significant impact to recovery of woodland products due to limited existing and potential use in the WSA and the availability of woodland products closer to population centers.

LIVESTOCK

Grazing use would continue with no substantial change. The one operator with cattle use could continue grazing of the estimated 37 AUMs within the WSA. The WSA contains 8 percent of the total allotment. The existing range projects (one fence, corral, and developed spring) would continue to be used and maintained as in the past based on practical necessity and reasonableness. Development of future roads or other livestock management facilities for use with the 37 AUMs in the WSA could be restricted to preserve wilderness values. No new range projects are proposed for this WSA.

VISUAL RESOURCES

Wilderness designation would result in the preservation of the area's high quality visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through closure of the entire area to ORV use, and through closure of the area to future mineral leasing and location. No visual resource impacts from mineral, energy, or range developments would be expected under this alternative.

CULTURAL RESOURCES

Wilderness designation for the WSA would benefit cultural resources by limiting the amount of surface-disturbing activity (especially additional roads) and by restricting motorized access. Experience in other portions of this resource area indicates a direct correlation between additional access and sites vandalized for illegal artifact collection. The 37 recorded and 700 potential sites (470 of which are potentially National Register eligible) would thus be protected.

Additional visitation into the WSA has the potential for accelerated deterioration of the more accessible cultural sites. Stabilization and scientific excavation would be allowed, but would have to be done in a manner compatible with the wilderness setting. Still, the protection afforded by wilderness management would outweigh problems from increased recreational activity and restrictions on cultural resource management.

RECREATION

Although use is currently low (approximately 240 visitor days per year), the WSA has outstanding primitive recreational values. If designated, the opportunities for dayhiking and general sightsee-

ing would be recognized, managed, and preserved. As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an increase in primitive recreational use above the baseline rate. Judging from use densities of a number of well known wilderness areas and primitive areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites, it is estimated that use after designation could be as much as 899 visitor days per year. (USDI, BLM, 1985.) This is 659 visitor days (375 percent) over the area's current estimated 240 annual visitor days. Management provided through a Wilderness Management Plan would attempt to control destructive increases in future recreation use; however, due to the small size and configuration of the WSA, the quality of the primitive recreation experience could be negatively affected by the increased use. Use of ORVs in the Mule Canyon WSA is minimal and closure of the WSA to vehicle use would result in little change from the current situation. Commercial outfitting would not benefit from wilderness designation because opportunities for commercial enterprise are limited.

WILDERNESS VALUES

The wilderness values of naturalness and special features on 5,990 acres in this WSA would be protected through a wilderness designation by Congress.

Naturalness would be enhanced due to the restrictions on surface-disturbing activities and motorized uses. No surface disturbance from mineral development is anticipated under this alternative. Currently limited ORV use is made by recreationists and gatherers of woodland products between U-95 and the rim of the south fork of Mule Canyon. This motorized access into the WSA would be closed to general vehicle use.

Wilderness designation on 5,990 acres would protect the special features present. The 37 recorded and 700 potential sites would be protected, as would the historic and scenic values.

Recreational use of the Mule Canyon WSA could be as much as 899 visitor days after wilderness designation (which is a 375-percent increase over the current estimated 240 annual visitor days). Nonmotorized recreation uses of the WSA, such as hiking and camping, would probably increase as much as about 2 percent per year because of general population increases. This increase in use would decrease opportunities for solitude and unconfined recreation because of the small size of the WSA and limited length of the canyons. If designated wilderness, specific management actions would be needed to maintain outstanding opportunities for solitude and primitive and unconfined recreation.

LAND USE PLANS AND CONTROLS

The existing BLM South San Juan MFP does not provide for wilderness designation. The forthcoming San Juan RMP will acknowledge the wilderness study but will not cover wilderness designation. Congressional designation of the WSA as wilderness would be an amendment to the applicable BLM land use plan. Wilderness designation would protect Dog Tank Spring from disturbance. However, future water development for public uses could be precluded with wilderness designation.

The *San Juan County Master Plan* recommends multiple use of all public lands in the county. This alternative would conflict with the county's multiple-use concept because restrictive conditions would be placed on mineral development and oil and gas leases would be phased out. There are no State lands within the WSA; thus, wilderness designation would not conflict with the policy of the State of Utah to maximize economic returns. Adjacent National Forest lands are not under wilderness review or designation and would not be affected.

SOCIOECONOMICS

Overall there would be no significant changes in current trends of population, employment, and local income distribution.

Because existing leases would not be reissued under wilderness designation, there could be losses in Federal revenues currently provided by oil and gas leases in the WSA (refer to Table 10) as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative. Valid existing oil and gas leases and mining claims could be developed, but designation would preclude new leases and claims from being established in the WSA. Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they would be with mineral development under the No Action Alternative. Because the potential for mineral development is low, it is estimated that potential mineral-related local income would not be significantly reduced by wilderness desig-

nation. However, any local income related to assessment of future mining claims would be lost.

Livestock use and ranchers' income would continue as at present with $750 of livestock sales and $300 of ranchers' return to labor and investment. There are no proposed improvements for livestock that would be foregone with this alternative.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section). Designation could result in an increase in recreational use of as much as 375 percent (from 240 current annual visitor days to 899 annual visitor days). Still, related local expenditures would be small (average of $4.10 per visitor day statewide).

Motorized recreational use of the WSA is currently light and any decrease in related local expenditures due to ORV closure would be small and insignificant to both the local economy and individual businesses.

The loss of leases on 5,590 acres now leased would cause an eventual loss of up to $16,770 per year of lease fees to the Federal Treasury. There would also be a potential loss of $930 annually in Federal revenues from the 310 acres that could be leased without designation.

Wilderness designation would eliminate most woodland product harvesting and related Federal revenues. There are few, if any, revenues from this source.

No existing rights-of-way or permits would be eliminated through wilderness designation.

Recreation-related Federal revenues could increase if the demand for commercial outfitter services increases. There are presently no commercial outfitters using the WSA and it is unlikely that commercial recreational use would occur in the WSA.

Overall, it is concluded that wilderness designation of the Mule Canyon WSA would have no significant socioeconomic impacts.

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Cheesebox Canyon WSA

CHEESEBOX CANYON WSA

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CHEESEBOX CANYON WSA
(UT-060-191)

INTRODUCTION

General Description of the Area

Cheesebox Canyon Wilderness Study Area (WSA) contains 15,410 acres of canyon and mesa land administered by the BLM. Acreage variations from the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980) are due to more accurate measurement methods. The WSA is in San Juan County, about 34 miles west of the community of Blanding. Oriented in a northeast-to-southwest manner, it is about 9 miles long from north to south, and ranges from less than 1 to 5 miles wide.

Cheesebox Canyon cuts into a relatively flat mesa that includes Ram Mesa, Lone Butte, and Cheesebox Butte. White, Hideout, and K&L Canyons are also included in the WSA. The canyons and buttes are very steep-sided throughout the unit, with flat to rolling terrain on the intermediate plateau and on top of the highlands. There are large expanses of exposed slickrock in this WSA, especially in the canyon walls and areas on the plateau adjacent to the canyons. Most of the sandstone in the unit is light buff to gray colored, although several of the buttes display the alternate red-and-white bands characteristic of the Cedar Mesa Sandstone complex.

Vegetation in the canyon bottoms varies from very sparse in Cheesebox, Hideout, and K&L Canyons to scattered cottonwoods and tamarisk in White Canyon, with lush vegetation around seeps. On the steep slopes at the heads of the forks of Cheesebox drainages and on the north-facing slope of Pinyon Point (from 7,200 to 8,000 feet), Douglas fir and ponderosa pine predominate. Vegetation on the plateau between the canyons is pinyon and juniper, with various desert shrubs interspersed.

The average annual temperature near the WSA is 5l degrees Farenheit (F), with an average low of 37 degrees F and an average high of 65 degrees F. The record low is -2 degrees F, and the record high is 101 degrees F. Temperatures reflect a 3-degree F increase in temperature per 1,000-foot decrease in elevation.

Annual precipitation ranges from 10 to 16 inches over Cheesebox Canyon. January, May, and June are the driest months. July, August, and December are the wettest months. Annual total snowfall ranges from 15 to 50 inches.

Specific Issues Identified in Scoping

General issues pertaining to more than Cheesebox Canyon WSA are discussed in Volume I. Issues and concerns raised in public scoping meetings (USDI, BLM, 1984) and specific to Cheesebox Canyon WSA are responded to below.

1. *Comment:* The WSA contains oil and gas leases and mining claims. Visual impacts from mining outside the WSA are a conflict now.

   Response: As discussed in the Affected Environment, Wilderness Values section, the uranium mines and exploration cuts on the mesa cliff slopes of Home Mesa, Pinyon Point, Lone Butte, Fry Mesa (across Highway 95), and Found Mesa comprise highly visible imprints of human activity outside, yet near the unit. Due to these and other factors, a substantial portion of the WSA (6,100 acres) does not offer outstanding opportunities for solitude.

2. *Comment:* There are 10 oil and gas leases, 38 mining claims, and grazing permits in the WSA, plus mining dumps that can be seen from within the WSA.

   Response: The Affected Environment, Mineral and Energy Resources section discusses existing oil and gas leases (10) and existing mining claims (38) in the WSA. The Affected Environment, Livestock section discusses existing grazing use of the WSA. The effect of these activities on wilderness and visual resource values in the area is discussed under the Affected Environment, Wilderness Values and Visual Resources sections. Refer also to the response to the first comment.

3. *Comment:* This WSA has a desert bighorn sheep population that would benefit from wilderness management.

Response: As discussed in the Wildlife sections of this document, if the WSA were designated wilderness 15,410 acres of crucial yearlong desert bighorn sheep habitat would be protected from surface disturbance, benefiting the resident bighorn sheep.

4. *Comment:* The area has valuable woodcutting resources for Indian tribes and others in the area. Concern is expressed over the amount of Federal land removed from the full spectrum of multiple uses in the county and the impact on the availability of firewood.

Response: As discussed in the Forest Resources sections of this document, approximately 6,300 acres in the WSA are covered by a low quality pinyon-juniper woodland. Very little use of forest products has been made in the WSA, and the potential for such use is limited. There are many areas in the county with better access that are more suitable for forest product harvest.

5. *Comment:* The reasons stated for not recommending designation do not override the wilderness values of the WSA.

Response: During scoping for this Environmental Impact Statement (EIS), BLM presented a preliminary indication of areas considered suitable or unsuitable for wilderness designation. The preliminary indication of suitability was made public prior to the EIS to obtain further input which has assisted in the formulation of the EIS alternatives. Additional input is expected as a result of the public review and comment on the Draft EIS. At the conclusion of the EIS process, BLM will review and consider all of the information received and at that time will formulate a final recommendation of areas found suitable for wilderness designation. Rationale for such recommendations will be included in a Wilderness Study Report to be submitted to the Secretary of the Interior and, subsequently, to Congress. The rationale will be keyed to the criteria of the "Wilderness Study Policy" (USDI, BLM, 1982a) and to other resource management factors generally as described in Chapter 2, Volume I of this EIS.

6. *Comment:* The WSA has been imprinted by mining and exploration activities and includes several miles of roads.

Response: Human imprints in the WSA are described in the Affected Environment, Wilderness Values section. Imprints include approximately 5 miles of vehicular ways. The overall WSA appears substantially natural, however.

7. *Comment:* Sounds from Highway U-95 can be heard within the WSA at times.

Response: As discussed in the Affected Environment, Wilderness Values section, although traffic is not heavy on Highway 95, sights and sounds of highway traffic are an influence in the WSA for a substantial distance. Headlights at night are especially noticeable. Due to these and other factors, a substantial portion of the unit (6,100 acres) does not offer outstanding opportunities for solitude.

8. *Comment:* Sights and sounds of traffic on Highway U-95 only occasionally affect opportunities for solitude. Sounds can seldom be heard in the canyons; traffic is distant enough to not detract substantially from the feeling of solitude.

Response: Refer to the response to the previous comment. As discussed in the Affected Environment, Wilderness Values section, outside sights and sounds are largely blocked in the canyon portions of the WSA, and these areas offer outstanding opportunities for solitude.

9. *Comment:* Wilderness designation would protect White Canyon, a Nationwide Rivers Inventory Segment with potential for study and addition to the National Wild and Scenic Rivers System.

Response: As discussed in the Recreation sections of this document, White Canyon is a Nationwide Rivers Inventory Segment and wilderness designation would contribute to protection of its wild and scenic values.

10. *Comment:* In the inventory, 12,110 acres of the original Cheesebox Canyon inventory unit were deleted in possible violation of the inventory policy. However, the Site-Specific Analysis (SSA) does not take note of this important fact. Instead, the BLM proceeds to study the remainder of the unit that has been deprived of many miles of canyons containing outstanding opportunities.

Response: BLM's Intensive Wilderness Inventory decision to make Cheesebox Canyon WSA its present size was appealed by the Utah Wilderness Association to the Interior Board of Land Appeals (IBLA). On April 18, 1983, IBLA affirmed BLM's decision.

11. *Comment:* The oil and gas potential of

the WSA is rated low by Science Applications, Inc. (SAI, 1982). Based on proprietary information, representatives of the oil and gas industry believe the potential of the WSA to be at least moderate. This information should be considered in the Draft EIS.

Response: At this time BLM has not made an independent assessment of geologic information gathered by oil and gas companies. The SAI (1982) report will be used as the reference on oil and gas potential for this EIS, but information provided by the oil and gas industry and available mineral investigation reports by the USDI, Geological Survey and Bureau of Mines will be reviewed by BLM prior to making final wilderness recommendations to the Secretary of the Interior.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated From Detailed Study

No alternatives were identified for this WSA during scoping other than those analyzed.

Alternatives Analyzed

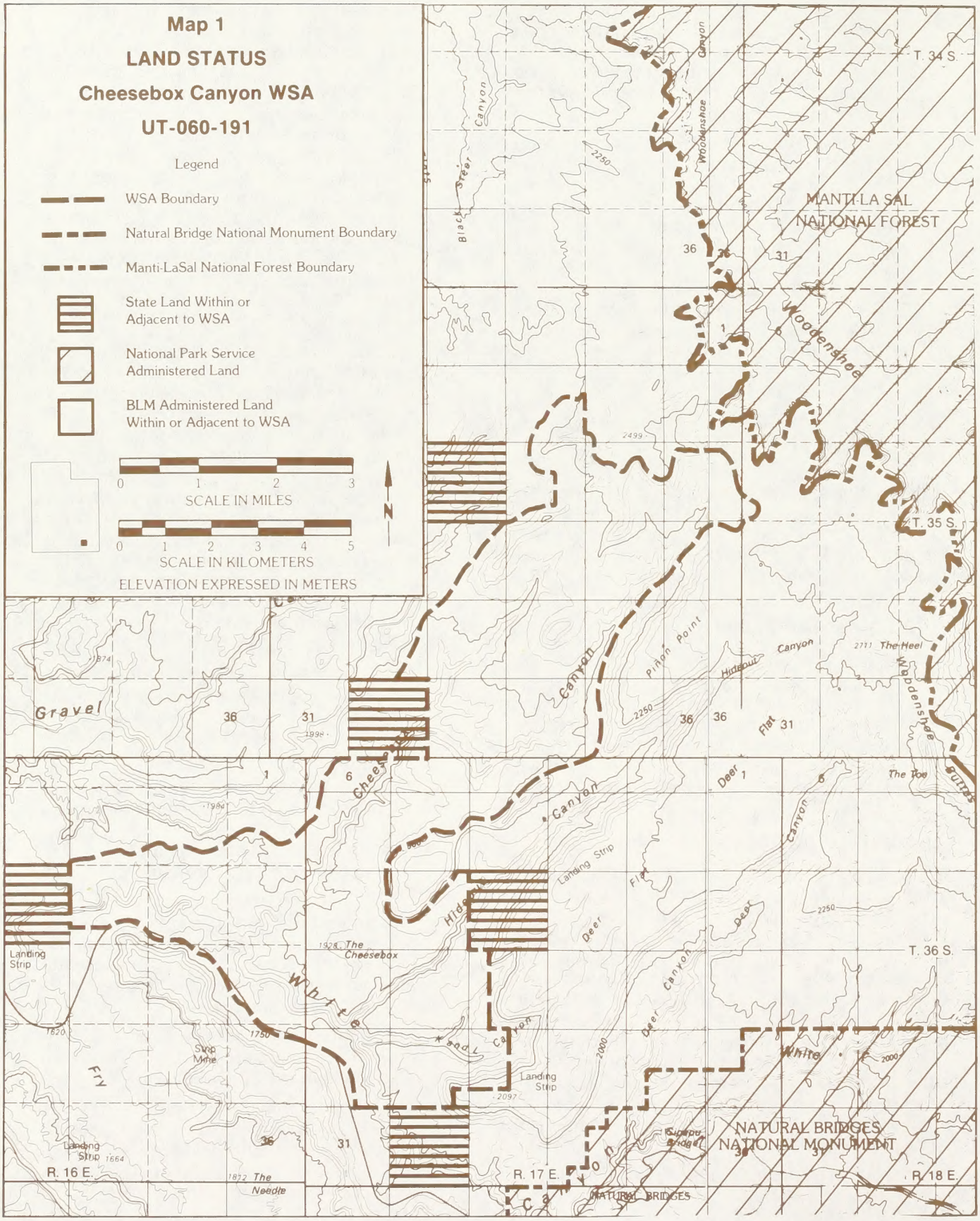
Two alternatives are analyzed for this WSA: (1) No Action; and (2) All Wilderness (15,410 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE (PROPOSED ACTION)

Under this alternative, none of the 15,410-acre Cheesebox Canyon WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the South San Juan Planning Unit Management Framework Plan (MFP) (USDI, BLM, 1971) until that plan is superceded by the San Juan Resource Management Plan (RMP) currently scheduled for completion in 1986. The five sections of State land adjacent to the WSA (refer to Map 1) have not been identified in the MFP for special Federal acquisition through exchange or purchase. No State or private lands are located within the WSA.

The following are specific actions that would take place under this alternative:

- All 15,410 acres would remain open to mineral location, leasing, and sale. Development work, extraction, and patenting would be allowed on 38 existing mining claims (760 acres) and future mining claims. Development would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases on 9,000 acres and future leases could be developed under leasing Category 1 (standard stipulations) on about 8,870 acres, Category 2 (standard and special stipulations) on about 6,040 acres, and Category 3 (no surface occupancy) on 500 acres.
- The present domestic livestock grazing use of 157 Animal Unit Months (AUMs) in the WSA would continue as authorized in the South San Juan Planning Unit MFP, until that plan is superceded by the San Juan RMP scheduled for completion in 1986, and by the White Canyon Allotment Management Plan. Use of the existing range developments (three stock trails, one corral, 90 acres of seeding, one fence, and one spring) would continue. New rangeland improvements (one stock reservoir and about 1 mile of fence) could be implemented without wilderness considerations.
- Use, maintenance, and development of facilities and improvements for wildlife, water resources, etc. could be allowed if in conformance with the MFP. None exist or are currently planned for the area.
- The entire WSA acreage would be open to off-road vehicle (ORV) use and new access routes for development would be allowed. The White Canyon area could be closed to ORV use in the future, as recommended in the MFP.
- The entire area (but primarily 6,300 acres of pinyon-juniper) would be open to woodland product harvest. There is no appreciable harvest of forest products at the present time, nor is any planned.
- The entire 15,410-acre area would continue to be managed as Visual Resource Management (VRM) Class II.
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.


Map 1
LAND STATUS
Cheesebox Canyon WSA
UT-060-191
Legend
WSA Boundary
Natural Bridge National Monument Boundary
Manti-LaSal National Forest Boundary
State Land Within or Adjacent to WSA
National Park Service Administered Land
BLM Administered Land Within or Adjacent to WSA
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
N
ELEVATION EXPRESSED IN METERS
MANTI-LA SAL NATIONAL FOREST
NATURAL BRIDGES NATIONAL MONUMENT
T. 34 S.
T. 35 S.
T. 36 S.
R. 16 E.
R. 17 E.
R. 18 E.
Black Steer Canyon
Woodenshoe Canyon
Woodenshoe
Gravel
Pinon Point
Hideout Canyon
The Heel
Woodenshoe Gulch
Cheesebox Canyon
Hideout Canyon
Landing Strip
Flat
Deer Canyon
The Toe
The Cheesebox
White Canyon
Sand Canyon
Strip Mine
Fry
Landing Strip
Landing Strip
The Needle
Natural Bridges
Sipapu Bridge
36
31
1
6

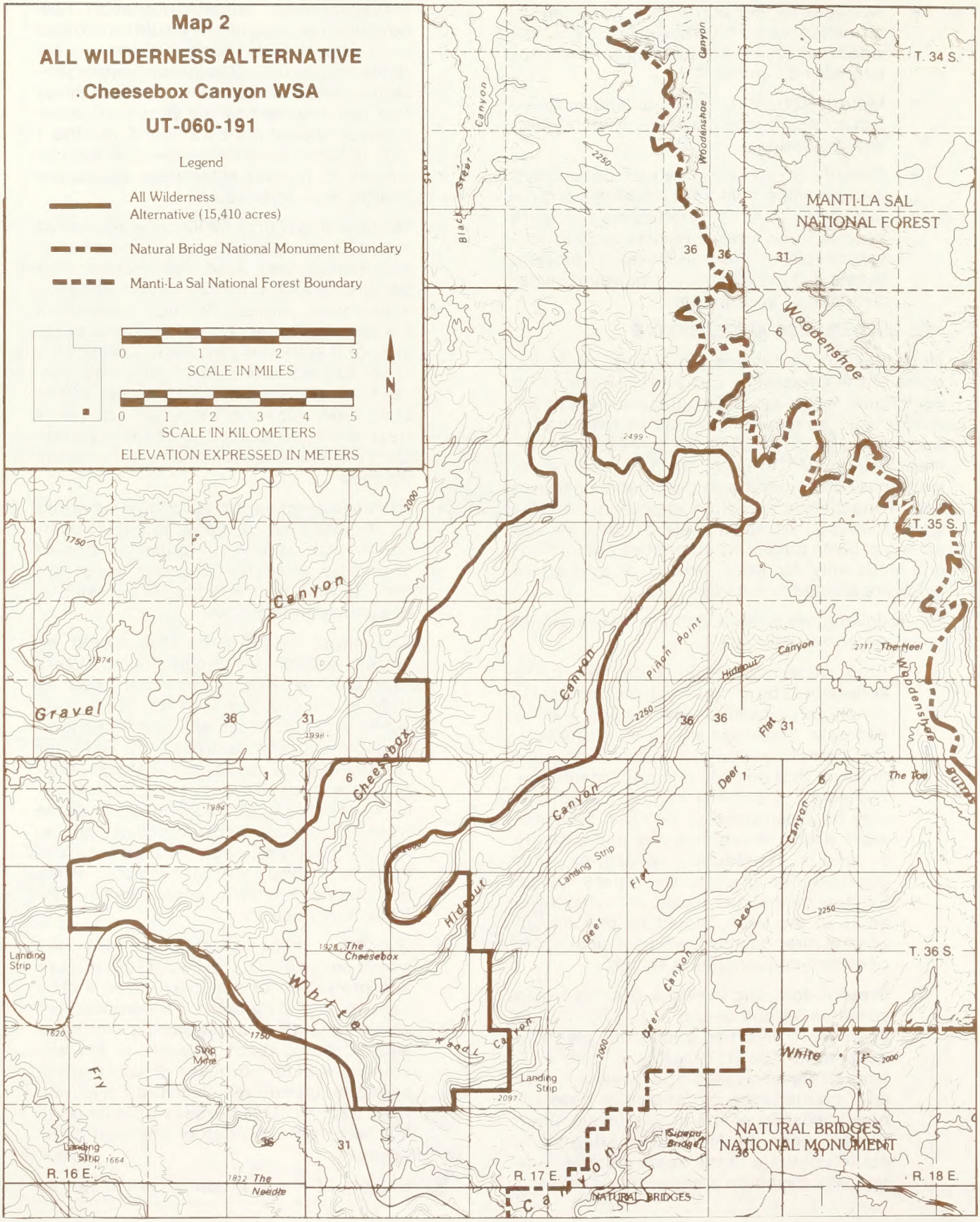
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Motorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

ALL WILDERNESS ALTERNATIVE

Under the All Wilderness Alternative, all 15,410 acres of the Cheesebox Canyon WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. Upon designation, acquisition of one State land section adjacent to the WSA (refer to Map 1) would be likely. The figures and acreages given under this alternative are for Federal lands only. No State, private, or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 15,410 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the approximately 760 acres of existing mining claims that may be determined to be valid. Development would be regulated by unnecessary or undue degradation guidelines, with consideration given to wilderness values. Existing oil and gas leases, involving 9,000 acres of the WSA, would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.
- Present domestic livestock grazing would continue as authorized in the South San Juan MFP or other applicable planning document. The 157 AUMs in the WSA would remain available to livestock. Use and maintenance of rangeland developments existing at the time of designation (listed under the No Action Alternative) could continue in the same manner as in the past, based on practical necessity and reasonableness. After designation new rangeland developments would be allowed on a case-by-case basis if necessary for rangeland and/or wilderness resource protection and management. It is assumed that development of the proposed stock reservoir would not be allowed, but the 1 mile of fence would be allowed as long as criteria to protect wilderness values are met (refer to Appendix 1).
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are located in the Cheesebox Canyon WSA, and none are currently planned.
- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values, as long as criteria to protect wilderness values are met. No wildlife developments are existing or planned in this WSA.
- The entire 15,410-acre area would be closed to ORV use except for: (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) for occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. About 5 miles of existing vehicular ways in the WSA would not be available for vehicular use except as indicated above. About 21 miles of roads (including 4 miles of State Highway 95), forming part of the boundary of the WSA, would remain open to vehicular use.
- A specific Wilderness Management Plan would be developed that would govern use and protection of the 15,410-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be


Map 2
ALL WILDERNESS ALTERNATIVE
Cheesebox Canyon WSA
UT-060-191
Legend
All Wilderness Alternative (15,410 acres)
Natural Bridge National Monument Boundary
Manti-La Sal National Forest Boundary
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
MANTI-LA SAL NATIONAL FOREST
NATURAL BRIDGES NATIONAL MONUMENT
T. 34 S.
T. 35 S.
T. 36 S.
R. 16 E.
R. 17 E.
R. 18 E.
Cheesebox Canyon
Woodenshoe Canyon
Black Steer Canyon
Hideout Canyon
Deer Flat Canyon
White Canyon
Gravel Canyon
Fry Canyon
Pinon Point
The Heel
The Toe
The Cheesebox
The Needle
Landing Strip
Swig Mine
Kachina Bridge
NATURAL BRIDGES

allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is minimal harvest of forest products at the present time, and none is specifically planned.

- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures, unless no other feasible alternatives exist.
- Hunting would be allowed subject to applicable State and Federal laws and regulations but without the use of motorized vehicles.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals, while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Air Quality

The Utah Division of Health has a network of air monitoring stations throughout the State. The closest monitoring station to the WSA is about 35 miles west at Bullfrog Marina on Lake Powell, where only particulate and sulfur dioxide concentrations are measured.

Only the short-term (24-hour) particulate standard has been exceeded at the Bullfrog station. These 24-hour violations were probably associated with conditions of high winds and blowing dust (resulting from the sparse vegetation and large areas of exposed sand). Sulfur dioxide concentrations measured at Bullfrog Marina are low and well under the applicable ambient standards.

Generally the air quality is very good over the WSA, allowing for long vistas where topography and vegetation permit. Visual range in the general vicinity averages between 100 to 132 miles during the summer (Aerocomp, Inc., 1984).

The WSA is in a Prevention of Significant Deterioration (PSD) Class II area under the provisions of the Clean Air Act as amended. The classification allows for moderate increases in air pollution levels.

Geology

Surface geology of the WSA consists almost exclusively of flat-lying beds of the Cedar Mesa Sandstone Member of the Cutler Formation of Permian Age. A few small islands of the overlying Moenkopi (and, in one place, the Chinle) Formation of Triassic Age are preserved toward the northern end of the unit.

The Cedar Mesa is typically a white, fine-grained, calcareous, and cross-bedded sandstone. It represents a near-shore shallow water marine deposit that has been transported into the area by long-

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
CHEESEBOX CANYON WSA

Resource	Alternatives	
	No Action (Proposed Action)	All Wilderness (15,410 Acres)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil, 18 billion cubic feet of natural gas, 500 tons of uranium oxide, and 50,000 tons of copper.	Oil and gas likely would not be recovered. Assuming a worst-case analysis, uranium and copper recovery may also be foregone. Due to the low likelihood of recovery of these mineral resources, however, the loss of development opportunity would not be significant.
Wildlife	About 1.2 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.
Livestock	Grazing of 157 AUMs and maintenance of existing developments would continue. New developments could be constructed; however, none are now proposed.	Grazing of 157 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. New developments proposed in the future might not be allowed.
Visual Resources	The quality of visual resources could be impaired on up to 180 acres.	Visual quality could be impaired on up to 20 acres.
Recreation	ORV use would continue on 5 miles of ways at current low levels. Overall recreational use could increase from the present 200 visitor days per year to 298 over the next 20 years. Up to 180 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including 5 miles of ways, would be closed to ORV use. Recreational use could increase to up to 1,541 visitor days over the next 20 years due to publicity associated with wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 180 acres (1.2 percent of the WSA).	Wilderness values would be protected, except on up to 20 acres (less than 1 percent of the WSA) which may be disturbed by development of valid mineral rights.
Land Use Plans and Controls	This alternative would be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the current BLM South San Juan MFP.	This alternative would not be consistent with San Juan County's concept of multiple use. It would not conflict with State policy. Designation would constitute an amendment of the BLM South San Juan MFP or the forthcoming San Juan Resource Management Plan.
Socio-economics	Annual local sales of less than $7,720 and Federal revenues of up to $27,220 would continue. An additional $19,230 per year in Federal revenues could be derived from leasing of presently unleased areas.	Annual local sales of less than $7,720 and Federal revenues of up to $220 would continue, but Federal revenues of up to $46,230 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.

shore currents from the northwest. The Cedar Mesa Sandstone interfingers eastward with the Cutler Formation.

The Moenkopi Formation represents a variety of depositional environments, including floodplain, tidal flats, alluvial, deltaic, and shallow marine. A continental environment predominated on the east side of the Paradox Basin area, and marine environments predominated on the west side during deposition of the Moenkopi.

The WSA lies west of the axis of the Monument Upwarp, a broad north-trending structural division of the Colorado Plateau. The Monument Upwarp is located in the south-central part of the Colorado Plateau. The Upwarp is 100 miles long, 50 miles wide, and trends northeast.

The WSA is within the Canyonlands Section of the Colorado Plateau Physiographic Province. This section is characterized by bare rock surfaces, plateaus, and steep-walled canyons. It is the section that is most rugged and least accessible. The canyons are precipitouss, escarpments separate dry plateaus, and erosion has produced picturesque buttes, arches, and natural bridges.

The WSA, which ranges in elevation from 5,200 to 8,200 feet, consists of a mesa cut by four meandering steep-walled canyons. Three canyons, Cheesebox, Hideout, and K&L, drain southwesterly to White Canyon, which drains southwest. The mesa itself dips gently to the southwest and is almost featureless except for a number of small buttes that rise several hundred feet. The slickrock sandstone canyons are extremely steep and rugged, plunging between 200 and 400 feet below the mesa.

Soils

The majority of this WSA consists of shallow, well-drained Rizno soils and exposures of rock outcrop. Deep and very deep, very stony and bouldery soils occur on steep fans surrounding Cheesebox Butte and other buttes, below the escarpment of the Mesa below Woodenshoe, and in White and Cheesebox Canyons. Some deep and very deep sandy and loamy soils occur on the sloping pediments above Cheesebox and White Canyons where eolian materials have accumulated (refer to Table 2).

The shallow, well-drained Rizno soils have textures ranging from fine sandy to sandy clay loam. They are intermixed with rock outcrop and are moderately susceptible to water erosion. Near White and Cheesebox Canyons, the proportion of rock outcrop increases dramatically. Deep and very deep Yarts and Mespun soils occur in basins and on the leeward side of ridges where eolian material has accumulated. These soils are subject to slight or moderate water erosion, but are subject to severe wind erosion when disturbed.

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Estimated Rate of Erosion (cubic yards/acre/year) Bare Soil Surface
Rock Outcrop	20	3,080	0	0
Shallow loamy soils on sloping structural benches	20	3,080	1	5
Deep loamy soils on dissected sloping Structural benches	40	6,170	1	5
Deep Stony Soils on steep canyonsides	20	3,080	1	10
Totals	100	15,410		

Source: Hansen, 1985.

The deep and very deep soils on steep fans in canyons and below escarpments are generally very stony and bouldery. In places, they are sandy where sand drifts have accumulated. These soils are subject to moderate or severe water erosion. The soils on the floors of White and Cheesebox Canyons are highly variable in soil depth, texture, and rock fragment content.

Erosion conditions are shown in Table 3. Under present conditions, average soil losses from erosion average an estimated 0.8 tons per acre per year.

Vegetation

The existing vegetation of the WSA is categorized in Table 4.

The desert shrub community includes the primary species of blackbrush and fourwing saltbush with an understory of curlygrass, Indian ricegrass, and other grass species.

The pinyon-juniper communities are dominated by trees about 10 to 15 feet in height.

The slickrock areas are basically bare rock or soil and have drainages with a low density of plants including pinyon, juniper, and cliffrose.

Table 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions			Annual Soil Loss if Disturbed		
		Percent of Area	Acres	Cubic Yards	Percent of Area	Acres	Cubic Yards
Very High	20.0	0	0	0	0	0	0
High	10.0	0	0	0	20	3,082	3,082
Medium	5.0	0	0	0	60	9,246	46,230
Low	1.0	80	12,328	12,328	0	0	0
Very Low	0.1	0	0	0	0	0	0
None	0.0	20	3,082	0	20	3,082	0
Totals		100	15,410	[1]12,328[1]	100	15,410	[1]49,312[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.8 under present conditions; 5.0 if disturbed.

A 90-acre seeding consists of a pinyon-juniper, serviceberry-sagebrush community that was chained and seeded to crested wheatgrass in the early 1950s.

There are no known threatened or endangered plant species in the WSA. There are four sensitive species (*Astragalus cottomii, Astragalus monumentalis, Erigeron kachinenis, Zigadenus vaginatus*) that may occur within the WSA and are candidate species under review by the Fish and Wildlife Service (FWS) for possible threatened or endangered status. There is no riparian vegetation in the WSA.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Desert shrub	950	06
Seeding	90	01
Pinyon-juniper	6,300	41
Barren (Slickrock)	8,070	52
Totals	15,410	100

Source: USDI, BLM, 1970.

The Cheesebox Canyon WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) types in the WSA are listed on Table 5. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 5
Potential Natural Vegetation Types

PNV Type	Acres	Percent of WSA
Blackbrush	9,250	60
Saltbush-greasewood	6,160	40
Total	15,410	100

Source: USDI, Geological Survey, 1978.

Water Resources

There is very little water within this WSA. There are no water wells or reservoirs in this unit. One developed spring is utilized by livestock in the west side of the WSA.

Runoff is retained in pools in the canyons, and water quality is generally good. Wildlife utilize these temporary pools of water.

Mineral and Energy Resources

The BLM, in consultation with the U.S. Department of Energy, had each WSA within Utah independently assessed for its energy and mineral resources by SAI (1982). Refer to Appendix 5 for a detailed description of the SAI rating system. The energy and mineral resource rating summary is given in Table 6.

TABLE 6
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f2	c1	Less than 10 million barrels of oil; less than 60 billion cubic feet of gas
Copper	f2	c3	Less than 50,000 tons
Uranium/ Vanadium	f2	c4	Less than 500 tons
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydroelectric	f1	c4	None
Manganese	f1	c1	None
Potash	f1	c3	None

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

An overall importance rating (OIR) of 2 was assigned to the Cheesebox Canyon WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA.

If the WSA is recommended as suitable, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider the reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. There is a low potential for copper and vanadium, that are currently listed as strategic and critical materials within the WSA (Federal Emergency Management Agency, 1983). Although listed as strategic and critical, copper is relatively common. Supplies currently exceed domestic demand.

LEASABLE MINERALS

Due to unfavorable geologic conditions, it has been determined that no coal, potash, geothermal, or other leasable resources, with the exception of oil and gas, are present in this WSA. Also, no leases for these minerals are present in the WSA.

Oil and Gas

Only a few exploratory wells have been drilled in the vicinity of the WSA. Most of the wells were drilled in the late 1950s and early 1960s following large discoveries at Aneth and Lisbon Valley outside the WSA. Although all wells that have been drilled in this general area are now abandoned, oil staining has been reported from Mississippian and Pennsylvanian rocks north of the unit, and oil shows in Devonian, Mississippian, and Pennsylvanian rocks have been reported from wells south of the unit.

Despite the favorable stratigraphy in the vicinity of the WSA, broad uplifts beginning in late Cretaceous time have significantly lowered the oil and gas potential of the Paradox Formation in this area. As a result of this uplift, erosion has stripped away overlying Mesozoic sedimentary rocks across most of the Monument Upwarp (remnants of these Mesozoic rocks are preserved in the WSA). Furthermore, much of the Pennsylvanian section is exposed to the north in Cataract Canyon and the south along the San Juan River. It is, therefore, very unlikely that reservoir pressure exists in Pennsylvanian rocks throughout much of this area. If oil and/or gas existed in the Paradox Formation and overlying units in the WSA, there is a good chance it has drained away. Pennsylvanian and Permian rocks in and near the WSA probably do not contain large reserves of oil and/or gas. On the other hand, small accumulations that were effectively sealed from drainage may still exist in Pennsylvanian rocks underlying the WSA. The low favorability rating indicates possible in-

place accumulations of less than 10 million barrels of oil or less than 60 billion cubic feet of gas. Of these amounts, an estimated 3 million barrels of oil and/or less than 18 billion cubic feet of gas could be recoverable.

The BLM established oil and gas leasing categories for the area in 1975 (USDI, BLM, 1975). Within the WSA, three categories exist: Category 1 (open to leasing with standard stipulations) on 8,870 acres (58 percent of the WSA), and Category 2 (standard and special stipulations) on 6,040 acres (39 percent of the WSA). The special stipulations are to protect desert bighorn sheep during rutting and lambing seasons from October 15 to December 15 and from April 1 to July 1 each year. The remaining 500 acres (3 percent of the WSA) are in Category 3 (no surface occupancy).

The WSA has 10 oil and gas leases covering approximately 9,000 acres. Of these, six leases (5,900 acres) are pre-FLPMA and four leases (3,100 acres) are post-FLPMA.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA leases.

Leases that are producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

The Woodenshoe (oil and gas) unit covers about 6,300 acres of the WSA. This unit was established to allow more efficient operations (i.e., should a reservoir be discovered, the unit could be managed as a single tract rather than as fragmented leases). The unit includes both pre-FLPMA and post-FLPMA leases, and activities are subject to stipulations issued at the time of leasing.

LOCATABLE MINERALS

The WSA lies within the White Canyon uranium mining district. The uranium deposits are concentrated in the Shinarump Member of the Chinle Formation and they generally contain copper as a by-product. White Canyon is one of the most productive districts in the State that produces uranium from the Chinle Formation. By mid-1965, a few thousand tons of uranium oxide had been extracted from the Shinarump Member, with the Happy Jack Mine (about 10 miles west of the WSA) accounting for the bulk of this production.

Although the WSA is surrounded by favorable deposits of the uranium-bearing Chinle Formation, it has limited uranium potential. Most of the Chinle Formation, except in one small knoll (totalling 10 acres), has been eroded away. The boundaries of the WSA extend up to the edge of the Chinle Formation in many areas. The Cutler Formation contains uranium deposits at Lisbon Valley, but no known uranium anomalies have ever been detected from this formation near the WSA.

Because copper, vanadium, and uranium are so closely associated on the Colorado Plateau and because this area is not favorable for uranium, the WSA is assigned a low favorability for these minerals. The combined potential of these minerals is less than 500 tons of uranium oxide.

The favorable host rocks for manganese (the Morrison, Summerville, and Chinle Formations) have been removed from the WSA by erosion. The nearest known manganese deposits are more than 50 miles to the northeast. Based on this and the fact that manganese is not known to be associated with the Paleozoic sequence on the Colorado Plateau, the WSA is assigned no favorability for manganese.

Other locatable minerals, such as lead, zinc, and silver are essentially absent in the WSA.

BLM records show that 38 mining claims on 760 acres have been located within this WSA. All of the claims appear to have current assessment work.

SALABLE MINERALS

No salable materials (gravel, sand, riprap stone, etc.) are available in the WSA.

Wildlife

The WSA provides habitat for animals commonly

found in rocky pinyon-juniper environments of southeastern Utah.

A few mule deer inhabit the northeast end of the WSA yearlong. Most of the use is during the winter months. The WSA is in Deer Herd Unit 31B, which was closed to hunting during the 1980, 1981, and 1982 seasons due to low herd productivity.

The WSA is within the White Canyon-Red Canyon Desert Bighorn Habitat Management Area. Desert bighorn sheep utilize the upper ends of Cheesebox Canyon. The bighorn sheep use this area along with Found Mesa and Fry Point. The 15,410 acres in the WSA are considered crucial yearlong bighorn sheep habitat.

Mountain lion, bobcat, and spotted skunk inhabit these canyons but are rarely observed. Coyote, cottontail rabbit, whitetail antelope squirrel, chipmunk, deer mice, whitethroat woodrat, and assorted bats (mostly western pipistrel) are found throughout the area.

There is no waterfowl habitat in the WSA. No raptor nesting sites have been identified. Mourning dove probably nest in the area. Chukar, a gamebird introduced from Asia, may utilize portions of the WSA. Hairy woodpecker, violet-green swallow, pinyon jay, titmice, rock wren, red-tailed hawk, and ravens utilize the pinyon-juniper area.

In the WSA the most common reptile and amphibian species are the side-blotched lizard, plateau lizard, and Hopi rattlesnake.

Bald eagles are winter transients in the area; however, no roosting sites have been identified. The FWS has not identified any threatened or endangered species in this WSA.

There are no existing wildlife management facilities or proposed vegetation treatments for wildlife enhancement in the WSA.

Forest Resources

A pinyon-juniper woodland occupies approximately 6,300 acres in the WSA. These are low quality sites (20 cubic feet usable wood per acre) and are considered nonproductive forest land. There are less than 980 cords of fuelwood in the WSA. At the present time, pulp and papermaking opportunities are low. No areas near the WSA have been designated as Christmas tree cutting areas. It is unlikely that over 10 individuals have gathered firewood from the WSA. It is also unlikely that any fenceposts were cut in this WSA.

Occasional recreationists may have gathered pine nuts, but there have been no commercial gathering permits issued in or near this WSA.

Livestock and Wild Horses/Burros

The WSA lies within and encompasses about 6 percent of the White Canyon Grazing Allotment. The entire allotment is operated by one grazing permittee with a year-round grazing preference for 450 cattle and 12 horses for a total of 5,544 AUMs. The small strip of seeding is grazed in the spring (June 1 to June 30) and fall (November 1 to December 1). The remainder of the area is winter grazing (December 1 to April 10). Table 7 summarizes livestock grazing use data.

Estimated forage production in the WSA is approximately 157 AUMs. Estimated cattle use in the WSA is 31 cows for 5 months.

Existing developments in the WSA include a 90-acre seeding, a developed spring, a 1-mile-long gravel trail, horse trails in Hideout and Cheesebox Canyons, a corral and a fence. Proposed rangeland improvements include a reservoir and two short fences. No land treatments are proposed.

The extent to which an existing vehicular way is used to manage livestock in the unit is not known.

Table 7
Livestock Grazing Use Data

Allotment	Class of and Number of Livestock	Number of Operators	Season of Use	Total AUMs	AUMs in WSA	Total Acres	Acres in WSA	Percent of Allotment in WSA
White Canyon	450 cattle 12 horses	1	3/1-2/28	5,544	157	248,757	15,410	6

Source: USDI, BLM, 1970.

There are no wild horses or burros in this WSA.

Visual Resources

The landscape character of the WSA consists primarily of four steep-walled canyons: White, Cheesebox, Hideout, and K&L. The canyon bottoms are very narrow and undulating. Smooth-textured walls have truncated ledges with some broken rock. Dark-brown desert varnish stains create interesting color contrasts with the predominantly gray sandstone.

The tablelands between the canyons are composed of flat to low rolling hills. Colors are pinks, reds, light browns, and grays. Vegetation is open pinyon-juniper stands with some desert shrubs. Textures are coarse to fine.

The existing cultural modifications present in the WSA (refer to Wilderness Values, Naturalness section) create low contrast with the characteristic landscape.

The entire WSA (15,410 acres) contains Class A scenery. Class A scenery combines the most outstanding characteristics of the physiographic region. The WSA contains both low and high sensitivity areas. The WSA contains foreground/middleground, background, and seldom seen distance zones.

The WSA has been evaluated as a VRM Class II area. (Refer to Appendix 7 for a description of BLM's VRM rating system.)

Cultural Resources

No significant archaeological inventory work has been conducted in the Cheesebox Canyon area. A small number of cultural resource clearances, primarily related to seismic activity, have been performed here. The lack of site information from this area is a reflection of the lack of inventory work. Where work has been completed, sites have been found.

Because of difficulty in accessing the area, this WSA potentially contains numerous pristine cultural resources. A literature search revealed 12 recorded sites representing a predominance of Pueblo cultural manifestations. Most of these sites are cliff dwellings that include habitation and/or storage structures (granaries).

There are no existing National Register sites and/or nominations in this WSA. However, based on estimates from similar settings in the area, it could be expected that 600 sites would be located in the WSA of which up to 400 could be National Register eligible.

Historic activity in the WSA primarily relates to use of the range for cattle and sheep grazing. Physical evidence remaining from this land use consists of scatters of cans, bottles, and other debris situated on the rim of White Canyon where stock was trailed to points east.

Recreation

Limited access and the rugged topography of this WSA restrict the recreational use to rugged and hardy individuals. No statistics are available for visitor use; hiking and backpacking use is estimated at less than 100 user days per year.

Occasional use occurs in White Canyon from hikers originating at the Natural Bridges National Monument approximately 3 miles upstream from the southeastern boundary of the WSA. White Canyon extends approximately 6 miles through the WSA. White Canyon is a Nationwide Rivers Inventory Segment with potential for study and possible addition to the National Wild and Scenic River System (USDI, National Park Service [NPS], 1982). The inventory found that this segment is an excellent example of intermittent stream in this region and passes through Natural Bridges National Monument. Since it is an inventory-listed segment, the BLM must avoid or mitigate any adverse impacts to the canyon and intermittent stream and consult with the NPS before taking any action that could foreclose wild, scenic, or recreational river status (Council on Environmental Quality, 1980).

Desert bighorn sheep are found in the unit, which is a part of the South San Juan Bighorn Sheep Hunting Unit. No statistics are available as to the number of hunters or days spent hunting within the WSA. Estimated use is less than 100 user days per year.

Mule deer hunting has occurred in the past, generally adjacent to roads that border the west and north portions of the WSA. Cheesebox is a portion of the Utah Division of Wildlife Resources (UDWR) Deer Hunting Unit 31-B, which has been closed to deer hunting for the past four seasons. Prior to 1980 the interior of the WSA was seldom used for hunting.

Vehicular use of the unit is associated with access for other activities rather than solely for ORV purposes and occurs on existing ways. Vehicular activities do not occur in the canyons due to rugged terrain.

Overall, it is estimated that current recreation use in the WSA does not exceed 200 visitor days per year.

Wilderness Values

SIZE

The WSA contains 15,410 acres of public land, which is of sufficient size for wilderness values to be present. The WSA varies from less than 1 mile to 5 miles wide and is approximately 8 miles long north to south.

NATURALNESS

The major imprint inside the WSA boundary is a way that intrudes into the unit from the western boundary road for 4.1 miles. It winds around the head of the west fork of Cheesebox Canyon along the plateau and ends at the rim of the east fork of Cheesebox Canyon. It was originally constructed with mechanical equipment, but is now maintained solely by the passage of vehicles.

Just below the rim of Home Mesa, cuts have been made by a bulldozer probably in search of uranium deposits. These cuts total about 2 miles, exposing soil on the steep hillside. These cuts lead nowhere in particular and are not traveled regularly.

Forming the unit's eastern boundary, a road cuts through the forested slope of Pinyon Point. This road is the unit's boundary for 6.7 miles to Lone Butte. At Lone Butte the road switchbacks 600 feet up to the butte top. A fork of this road cuts across the eastern cliff face of Lone Butte, ending at a mine just around the tip of the butte. This mining activity is evident from a distance because of gray tailings that have spilled down the side of the red butte.

A short way leaves Highway 95 on the unit's extreme southwest, weaves among the sparse pinyon-juniper trees, and loops back on itself at the edge of a State section.

A few range-associated imprints are concentrated in a canyon just east of Nook Canyon. On the western rim of the canyon there is an old brush-fence corral about 30 yards in diameter. A stock trail has been constructed leading from this corral into the small canyon. The trail is perhaps 75 yards long with rock-blasting evident in a few places. Where this trail meets the canyon bottom, a four-strand barbed-wire fence spans the canyon bottom. Just up canyon from this fence, the wash bottom forks and two pour-offs prevent further travel. A developed spring is located in this portion.

At the western foot of Ram Mesa, a seismic line crosses the boundary road into the unit. This line is well screened by the pinyon and juniper trees on the ground but shows up clearly from the air or high points of the WSA.

A stock trail climbs a ridge on the unit's northeast side up to Home Mesa. This trail is referred to as the Gravel Trail. Wheeled travel on this trail is not possible. The trail makes use of a slickrock wash where it leaves the boundary road. This trail is not a substantial impact upon wilderness values; it is an eroding trail 3 to 5 feet wide.

The horse trails mentioned in the Livestock section could not be found in the summer of 1982 and have probably become overgrown from lack of use.

The 15,410 acres of land within the borders of Cheesebox WSA are generally free of the imprints of human activity and appear natural.

SOLITUDE

About 24 miles of deep, narrow, and tightly meandering canyons provide opportunities for solitude.

Cheesebox Canyon cuts into relatively flat pinyon-juniper-covered terrain that is enclosed by highlands rising 550 to 1,000 feet above this intermediate plateau. The eastern and western boundary roads run along the bases of these higher mesas and comprise substantially noticeable cuts through the forested mesa land and intrude upon a visitor's feeling of isolation. The uranium mines and exploration cuts on the mesa cliff slopes of Home Mesa, Pinyon Point, Lone Butte, Fry Mesa (across Highway 95), and Found Mesa also comprise highly visible imprints of human activity outside, yet near, the unit.

Major commercial airline traffic over the WSA, although high and not always heard, is fairly constant daily. Its impact on wilderness solitude is negligible, although contrails sometimes streak the sky.

The cuts and fills of Highway 95 can be seen from as far as the northern end of the unit. Although traffic is not heavy on this highway, sights and sounds of highway traffic are an influence into the WSA for a substantial distance. Headlights at night are especially noticeable in the unit. Due to the above factors, a substantial portion of the WSA (6,100 acres) does not offer outstanding opportunities for solitude. Within the canyons of this unit, however, these outside influences are largely blocked. Even part of White Canyon, less than 1 mile from the highway, is sufficiently deep and narrow to block outside sights and sounds.

In summary, in over 60 percent of the WSA (9,310 acres) the opportunities for solitude meet the outstanding criteria.

PRIMITIVE AND UNCONFINED RECREATION

The canyons and buttes rising above the plateau offer varied challenges to the primitive recreationist. Traversing the canyons is sometimes very challenging due to pour-offs or pools of water, and getting out the sides is often very difficult. Hiking and camping opportunities include backpacking, dayhiking, rock scrambling, swimming in the plunge pools, hunting, and exploring and discovering side canyons, seeps, pools, sculptured sandstone formations, and ancient Indian ruins. Nature study and sightseeing are also recreational pursuits available.

The WSA has an irregular boundary, becoming less than 1 mile wide in places. Additionally, in the southern half of the WSA, only the area within the canyons offers outstanding solitude, further confining the area's primitive recreation opportunities. Approximately 6,100 acres do not meet the outstanding recreation criteria.

It is the outstanding opportunities within the canyons and northern portion of the WSA (9,310 acres) that allow this WSA to meet the outstanding primitive and unconfined recreation criteria.

SPECIAL FEATURES

Cheesebox Canyon WSA contains supplemental values including archaeological sites, early cowboy use, wildlife habitat, and scenic values in the surrounding areas.

There are 12 recorded archaeological sites within the unit. Late 19th and early 20th century cowboys roamed the canyons of southeast Utah herding cattle. Hite was a popular Colorado River crossing in those days and the rim of White Canyon was used as a route to points further east. Outlaws also used these canyons, disappearing in Hideout Canyon occasionally.

The WSA is within the White Canyon-Red Canyon Desert Bighorn Sheep Habitat Management Area. Desert bighorn sheep utilize the upper ends of Cheesebox Canyon, as well as Found Mesa and Fry Point. Each year a limited number of desert bighorn sheep permits are issued to hunters on a once-in-a-lifetime basis. The sheep are a prized big game trophy.

Natural Bridges National Monument is less than 2 miles to the east and includes part of White Canyon. Hikers from the monument sometimes extend their trips into the WSA portion of White Canyon.

Scenic values are very good throughout the unit. The canyons offer sculptured rock with swirling patterns, carved pools, and sheer rock walls. Views include the cliffs of the highlands to the east, the Wingate Buttes in the south, as well as Navajo Mountain, the Henry Mountains, and the valley of White Canyon, all outside the unit.

Land Use Plans and Controls

The WSA is comprised solely of public lands administered by the BLM. There are four sections of State land adjacent to the WSA and one section of State land that corners the WSA. There are no State or private lands within the WSA. No withdrawals are known to exist in this WSA. There are existing oil and gas leases and mining claims (refer to the Mineral and Energy Resources section for a more detailed discussion). There are no other permits, leases, or licenses for land uses in the WSA.

Legal access to the WSA is gained by U.S. Highway 191 and State Highway U-95, the southwest boundary of the WSA, and from county roads that form the northwest and northeast boundaries of the WSA. Only one vehicular way is actually within the WSA.

There are no lands contiguous to the WSA being considered for wilderness. However, lands within 0.25 mile of the northeast boundary of the WSA comprise the National Forest Dark Canyon Wilderness Area.

The BLM South San Juan MFP recommended the area be evaluated as a Primitive Area (the pre-FLPMA designation for areas with wilderness characteristics). The South San Juan MFP will be replaced by the San Juan RMP in 1986.

The *San Juan County Master Plan* (Planning and Research Associates, 1967) indicates that this area should be used as open range and forest land. The plan predates wilderness considerations; however, the San Juan County Commission (1980) has pointed out that "nearly 20 percent" of the land in the county "has already been set aside for protection and preservation" and that the remainder of the county is "designated multiple use by our land use planning and zoning ordinance. The San Juan County Commission opposes any wilderness areas being legislatively or administratively designated in the county."

Socioeconomics

DEMOGRAPHICS

The WSA lies in western San Juan County. The

nearest community is Blanding, approximately 60 road miles away. The socioeconomic effects of designation would be confined mostly to San Juan County. The county can be summarized as rural and sparsely populated. Even though local employment in the mining industry decreased by 20 percent between 1980 and 1982 due to a downturn in local uranium mining and milling, it still remains the largest local private employer (Utah Department of Employment Security, 1983).

San Juan County had a 1982 population of 12,700, not quite 1 percent of the State population (U.S. Department of Commerce [USDC], Bureau of the Census, 1981). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers: Monticello, the county seat, had a 1980 population of 1,930 and Blanding had a 1980 population of 3,120 (USDC, Bureau of the Census, 1981).

San Juan County is one of the largest counties in Utah, comprising 7,885 square miles (about the size of New Jersey). About 85 percent of the county is owned by the Federal Government, 6 percent by the State of Utah, and 8 percent by private landowners (University of Utah, Bureau of Economic and Business Research, 1982). The southern portion of the county is included in the Navajo Indian Reservation.

EMPLOYMENT

Recent statistics (refer to Table 8) indicate that mining directly accounts for half of the income and over 32 percent of the employment in the county (USDC, Bureau of Economic Analysis, 1983). Because the mines and mine employees both purchase products locally, mining's total local importance is even greater. Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are on welfare and are, therefore, not included in unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

INCOME AND REVENUES

Past activities in the WSA that could be of some local economic consequence include mining claim assessment, livestock production, hunting, and dispersed nonmotorized recreation.

The WSA has 38 mining claims with current assessment work. Regulations require a $100 per claim annual expenditure for labor and improvements to keep the claim current. Some of these expenditures are made within the local economy.

TABLE 8
1981 Wage and Salary Employment and Income
San Juan County, Utah

Type/Source	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance and Real Estate	1	1
Services	8	11
Other	-	-
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	98
Unemployment (1st Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

Note: Because of rounding, numbers are not additive. Employment percentage figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services.

One livestock operator has grazing privileges in the WSA. Based on the consumption of 157 AUMs of forage by livestock, it is estimated that the WSA accounts for $3,100 of livestock sales, including $1,200 of ranchers' returns to labor and investment.

Historical hunting pressure in the WSA has been low, and its local economic importance is insignificant. Other recreation use is low and related expenditures locally insignificant. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for Cheesebox Canyon WSA is estimated as about 200 visitor days per year. Only a portion of the $820 expenditures for recreational use of the

WSA contributes to the local economy of San Juan County.

The WSA generates revenues to the Federal Treasury from two sources: grazing and mineral leasing. Within the WSA, about 9,000 acres are currently leased for oil and gas. At $3 per acre, this generates about $27,000 annually. Half of this, or about $13,500, is allocated to the State of Utah. The State then reallocates these revenues to various funds, the majority of which are related to energy development. How much, if any, is distributed at the local level is not known. Based on 157 AUMs of forage consumed by livestock in the WSA, with the current annual grazing fee of approximately $1.40 per AUM, the WSA annually accounts for approximately $220 of grazing fee revenues to the Treasury. Half of this is allocated back to the local BLM district for construction of range improvement projects. Income and revenues from the WSA are summarized on Table 9.

TABLE 9
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Mining Claim Assessment	$3,800	None
Oil and Gas Leases and Production	None	$27,000
Livestock Grazing	$3,100	$220
Recreational Use	Less than $820	None
Total	Less than $7,720	Up to $27,220

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total income that would be generated by these expenditures.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements of all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative (Proposed Action)

The major changes that could occur in the area (although the likelihood is thought to be low) would be related to oil and gas and locatable mineral exploration and development. The area would be open to mineral resource use and development without controls for wilderness protection. The degree of future development is unknown but would probably be low due to the WSA's rough terrain and limited resource potential. The following is a worst-case analysis based on the assumption that minerals would be developed sometime in the future and cause the following surface disturbance: oil and gas, 160 acres, and uranium and copper, 20 acres. (Appendix 10 lists surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed as a PSD Class II area. Disturbance of 180 acres would result in minor temporary increases in fugitive dust emissions. Because no major sources of air pollutant emissions are proposed in the vicinity of the WSA, air quality would remain essentially as at

present.

GEOLOGY

No impacts to geology are expected because surface disturbances associated with uranium and oil and gas exploration and development activities would probably not exceed 180 acres. This would not significantly affect geology.

SOILS

It is estimated that up to 180 acres of soil could be disturbed by mineral exploration and development. Assuming that all disturbance would occur in areas with low erosion class and that erosion condition would increase to high class (worst-case analysis), soil loss on the 180 acres would increase from 180 cubic yards/year to 1,800 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 1,620 cubic yards (approximately 12 percent) over the current annual soil loss to approximately 13,948 cubic yards per year.

VEGETATION

Although protective measures would be taken to avoid disturbance of the sensitive plant species *Astragalus cottomii, Astragalus monumentalis, Erigeron kachinensis*, and *Zigadenus vaginatus*, some individual plants could be inadvertently lost as a result of mineral exploration and development. Before authorizing surface-disturbing activities, BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Because necessary measures would be taken to protect these plants, if found, it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be preserved with the No Action Alternative. However, because protective measures would be implemented under BLM policy and regulation and the maximum anticipated disturbance would be no more than 180 acres, the disturbance allowed under this alternative would not result in a major change in any vegetation type.

WATER RESOURCES

Since precipitation is low and all streams and pools are ephemeral within the WSA, no significant sedimentation or change in total dissolved solids is expected to occur from as much as 1,800 cubic yards of annual soil loss from surface disturbance. Mineral exploration and development in the area would generally be confined at the surface or with widely spaced wells and would not significantly change ground water quality or quantity. Future watershed developments (none exist currently or are proposed) could occur but are not planned in the current MFP.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

The potential for up to 10 million barrels of oil and up to 60 billion cubic feet of natural gas (in-place) exists within the WSA. Up to 3 million barrels of oil and 18 billion cubic feet of gas could be recoverable. These oil and gas resources could be explored and developed, subject to Category 1 (standard stipulations) on about 8,870 acres, Category 2 (standard and special stipulations) on about 6,040 acres, and Category 3 (no surface occupancy) on about 500 acres. The operator's ability to explore and develop the area would be seasonally limited on the Category 2 area. Due to the small size of these deposits, production is not expected under this alternative.

Locatable Minerals

The entire WSA would remain open to mining claim location. Development of the 38 existing mining claims would not be restricted by wilderness constraints. The potential to recover as much as 500 tons of uranium oxide and less than 50,000 tons of copper exists under this alternative. Employment of unnecessary or undue degradation stipulations would not affect the operator's ability to develop the area. However, the likelihood of development is thought to be low because of economic considerations (e.g., transportation, low resource potentials, etc.).

WILDLIFE

Under this alternative, 15,410 acres of crucial yearlong desert bighorn sheep range would not be protected by application of the "Wilderness Management Policy" with its reduced likelihood for surface-disturbing and other activities. As much as 180 acres of this crucial bighorn sheep range could be subject to surface-disturbing activities associated with mineral exploration and development. Mobile animals including desert bighorn sheep would leave the area of disturbance and less mobile animal populations would be reduced during the time of disturbance.

There would be no impacts to threatened or en-

dangered animal species under this alternative because none are present within the WSA.

Future wildlife-related treatments or facilities could be developed without wilderness considerations, although none are currently planned.

FOREST RESOURCES

Woodland products (less than 980 cords) in this WSA could be harvested for private or commercial uses under this alternative. Not much use is currently occurring nor anticipated to occur in the future due to limitations on resource potential, topographic restraints on access, and the availability of the resource elsewhere.

LIVESTOCK

Domestic grazing would continue as authorized in the South San Juan MFP and White Canyon Allotment Management Plan. There would be no changes in or effect on the current livestock use and management under this alternative. The one operator with cattle and horse use could continue to allow grazing of the estimated 157 AUMs within the WSA. The WSA contains 6 percent of the total allotment. The existing range projects (90-acre seeding, one developed spring, one corral, one fence, and three trails) could be maintained by motorized means. The proposed projects (one reservoir and two fences) could be constructed unconstrained by wilderness stipulations. Existing vehicular ways (approximately 5 miles) could be used for livestock management.

VISUAL RESOURCES

Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual values in areas affected by the estimated 180 acres of surface disturbance from mineral and energy exploration and development would be degraded and VRM Class II management objectives would probably not be met during the short term. After rehabilitation, visual resources would be restored to meet VRM Class II objectives. Even after mitigation and rehabilitation, some permanent localized degradation would result. If roads, vehicular ways, and drill pads are located throughout the area (worst-case analysis), visual quality could be significantly reduced in the area as a whole.

CULTURAL RESOURCES

Disturbance of 180 acres by mineral exploration and development under this alternative has the potential to adversely affect cultural sites. However, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would lessen impacts. Still, some of the 12 recorded and 600 potential sites (400 of which could be National Register eligible) could be foregone. Vandalism of sites (not currently a problem) would be expected to increase in proportion to the general population increase. Experience in other parts of southeastern Utah indicates a direct correlation between additional access and sites vandalized for illegal artifact collection purposes.

Stabilization efforts and excavation could be completed wilderness considerations and would be easier to conduct under this alternative.

RECREATION

Up to 180 acres could be disturbed by mineral and energy activities. Primitive recreational opportunities and quality would be diminished on the affected areas. If roads, vehicular ways, and drill pads are located throughout the WSA (worst-case analysis), primitive recreational opportunities could be lost in the area altogether. The values for which White Canyon was identified as a Nationwide Rivers Inventory Segment could also be negatively affected, although BLM lease stipulations, consultation with NPS, and terrain limitations would minimize these effects.

Roads and ways created for mineral exploration and development would improve access into the area for nonprimitive recreation. Also, the approximately 5 miles of existing vehicular ways would continue to be open to vehicular access, including motorized access for recreation.

The future increase in recreational use of the WSA is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1982) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use is expected to increase from 200 current visitor days per year to 298 visitor days at the end of 20 years. Primitive recreational use would constitute nearly all of the estimated increase. Recreational activities utilizing vehicular access (hunting, sightseeing etc.), which is currently almost nonexistent, would increase only slightly unless deer hunting is allowed once again; however, there are no current plans to restore deer hunting in the area. ORV activity would increase only slightly due to the limited area suitable for ORV use. Commercial outfitting would not be a factor in the area.

WILDERNESS VALUES

Possible mineral and energy exploration and de-

velopment could disturb an estimated 180 acres. Possible range developments (reservoir and fence planned) could also disturb wilderness values. Wilderness values in this WSA (i.e., naturalness, opportunities for solitude and primitive recreation, and special features) would be lost or diminished in affected areas during mineral exploration and development. Approximately 15,410 acres of desert bighorn sheep crucial habitat and the 12 recorded and 600 potential cultural sites (400 of which are potentially National Register eligible) would be protected under existing laws and regulations but would not receive the additional protection from disturbance provided by wilderness management. Wilderness values could be lost in the area as a whole if roads, vehicular ways, and drill pads were located throughout the area (worst-case analysis).

LAND USE PLANS AND CONTROLS

This alternative is based on implementation of the BLM South San Juan MFP and the forthcoming San Juan RMP and, therefore, would be in conformance with these plans. This alternative would be consistent with the *San Juan County Master Plan* because land use would continue as at present. No State lands are located in the WSA; therefore, no State land use plans would be affected.

SOCIOECONOMICS

Overall, no changes in existing patterns or trends of population, employment, or distribution of local income would be expected. There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the potential oil and gas resource in the WSA were developed it would lead to increased employment and income for San Juan County. However, the probability of economic development of minerals within the WSA is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the existing grazing use (157 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase only 98 visitor days per year over the next 20 years and overall recreation-related expenditures average $4.10 per visitor day (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA would likely not be significant to the local economy.

Federal and State revenues would not be reduced by this alternative. There are 6,410 acres in the WSA open to oil and gas leases that are currently not leased. If leased, they would bring up to $19,230 additional Federal lease fee revenues per year. Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees (approximately $220 per year) would continue.

All Wilderness Alternative (15,410 Acres)

As noted in the Description of the Alternatives section, the major changes that could occur in the 15,410-acre area would be related to its withdrawal from mineral location and closure to new mineral leasing and sale. The entire area would be placed in leasing Category 4 (closed to leasing). About 5 miles of existing vehicular ways in the WSA would be closed to vehicular use except for approvals by BLM, as discussed in the Description of the Alternatives section. The WSA would be managed under VRM Class I.

For the following analysis, it is assumed that the existing mining claims would eventually be explored and developed, causing an estimated 20 acres of disturbance within the WSA. It is also assumed that the existing oil and gas leases would expire before production of commercial quantities, and that oil and gas leases would not be renewed or future leasing of oil and gas allowed. (Appendix 10 lists surface disturbance assumptions and estimates for the WSA.)

Because potentially disturbed areas would be smaller than under the No Action Alternative (20 vs. 180 acres), the impacts from development and surface disturbance on air quality, geology, and water resources would be less under the All Wilderness Alternative than for the No Action Alternative. Because the analysis of the No Action Alternative shows that impacts to these resources would be insignficant, they are not discussed under the All Wilderness Alternative. Other resources are addressed below.

SOILS

The soil resource would benefit under the All Wilderness Alternative because of the reduced likelihood for surface-disturbing activities.

Assuming that all disturbance would occur in areas with low erosion class and that erosion

condition would increase to the high class (worst-case analysis), soil loss on the 20 acres would increase from 20 cubic yards/year to 200 cubic yards/year. However, soil loss would decrease as reclamation occurred. The time for complete reclamation cannot be determined. Therefore, under this alternative, maximum annual increase in soil loss from surface disturbance in the WSA would be approximately 180 cubic yards (approximately 1 percent) over the current annual soil loss, increasing to approximately 12,508 cubic yards/year. The increase would be 1,440 cubic yards per year less than under the No Action Alternative.

VEGETATION

Because the potential surface disturbance would be about 20 acres, the potential for inadvertent disturbance of *Astragalus cottomii, Astragalus monumentalis, Erigeron kachinensis*, and *Zigadenus vaginatus* (all sensitive plant species) would be less under this alternative than with the No Action Alternative. Prior to authorizing surface-disturbing activities, BLM would apply appropriate measures as described for the No Action Alternative and the viability of populations of threatened, endangered, or sensitive plant species would be preserved.

Other vegetation would remain similar to that now existing with a continuing trend to climax conditions.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Although approximately 9,000 acres of the WSA (5,900 acres pre-FLPMA and 3,100 acres post-FLPMA) are under oil and gas lease, no exploration or development of oil and gas is presently occurring within the WSA.

Existing pre- and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases would be developed or a showing of commercial quantities made prior to their expiration dates (the pre-FLPMA leases will expire by October 1986). Expired leases would not be reissued.

Exploration for and development of a potential resource of 3 million barrels of oil and 18 billion cubic feet of natural gas considered recoverable would be foregone under this alternative. However, due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities, it is concluded that this alternative would not result in any significant loss of potential oil and gas recovery.

Locatable Minerals

There are currently 38 mining claims (760 acres) within the WSA, all current in assessment work. Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation under unnecessary or undue degradation guidelines. After designation, all other lands (including claims not determined valid) would be closed to prospecting and development (USDI, BLM, 1981). If the potentially recoverable minerals are not within mining claims filed prior to designation, the potential for recovery of up to 500 tons of uranium oxide and 50,000 tons of copper would be foregone.

It is estimated that up to 20 acres could be disturbed due to exploration of locatable mineral resources should this alternative be adopted. Because these metals are not currently produced and because economic considerations (e.g., transportation, low potential, etc.) are unfavorable, it is unlikely that development would occur even without wilderness designation. Therefore, this alternative would not result in a significant loss of recoverable locatable mineral resources.

WILDLIFE

Under this alternative 15,410 acres of crucial yearlong desert bighorn sheep range would be protected by application of the "Wilderness Management Policy" and by the reduced likelihood for surface-disturbing and other activities. However, as much as 20 acres of crucial yearlong desert bighorn sheep range could be subject to surface disturbance associated with existing mineral rights. This acreage represents less than 1 percent of the total crucial bighorn sheep habitat within the WSA.

There would be no impacts to threatened or endangered animal species under this alternative because none are present in the WSA. Future wildlife-related treatments or facilities would be limited to those compatible with wilderness values; however, none are planned.

FOREST RESOURCES

The opportunity to harvest the estimated 980 cords of fuelwood would be foregone with designation. This would not be a substantial impact to the forest resource due to the limited existing use in the WSA and availability of these resources closer to population centers.

LIVESTOCK

Grazing use would continue as authorized in the South San Juan MFP. The one operator with cattle and horse use could continue to allow grazing

of the estimated 157 AUMs within the WSA. The WSA contains 6 percent of the total allotment. Use and maintenance of the existing range projects (90-acre seeding, one developed spring, one corral, one fence, and three trails) would continue as in the past based on practical necessity and reasonableness. The proposed two fences might be allowed in the WSA but would have to be constructed in a manner compatible with the wilderness setting. The proposed reservoir probably could not be constructed to meet wilderness protection criteria and would be foregone. The ability to improve the distribution of livestock within the WSA would, therefore, be limited by this alternative. Development of future roads or other livestock management facilities for use with the 157 AUMs in the Cheesebox Canyon WSA would be restricted to preserve wilderness values. The approximately 5 miles of existing ways could no longer be used except for maintenance of existing developments. This would probably not affect livestock management in the WSA to a significant extent.

VISUAL RESOURCES

Wilderness designation would contribute to the preservation of the area's Class A scenery. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I (which generally allows for only natural ecological change) and through closure of the entire area to ORV use and future mineral leasing and location.

Under this alternative, possible mineral-related surface disturbance would be 20 acres compared to 180 acres under the No Action Alternative. Although mitigative measures would be applied to minimize visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation, some permanent localized degradation could be expected. Because the potential for development of mining claims is low and projected disturbance is only 20 acres, visual quality would probably not be reduced in the WSA as a whole.

CULTURAL RESOURCES

Wilderness designation would benefit cultural resources in the WSA by limiting the amount of surface-disturbing activity (especially additional roads) and by restricting motorized access. Experience indicates that lack of road access prevents or minimizes vandalism of sites for illegal artifact collection purposes.

The 12 recorded and 600 potential sites (400 of which could be potentially National Register eligible) would be protected. As much as 20 acres of surface disturbance from development of existing mining claims could result in inadvertent disturbance and loss of some sites, but the likelihood for significant loss would be much less under this alternative than under the No Action Alternative.

The additional recreation visitation in the WSA has the potential for accelerated deterioration of the more accessible cultural sites. Stabilization and scientific excavation would be allowed but would have to be executed in a manner compatible with the wilderness setting. Still, the protection afforded by wilderness management would outweigh problems from increased recreational activity and restrictions on cultural resource management. The overall impact would be positive.

RECREATION

Although use is currently low (approximately 200 visitor days per year), the WSA has high primitive recreational values. If designated, the opportunities for dayhiking and general sightseeing would be recognized, managed, and preserved. As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an increase in primitive recreational use above the baseline rate. Judging from use densities of a number of well known wilderness areas and primitive areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites; it is estimated that use after designation could be as much as 1,541 visitor days per year (USDI, BLM, 1985). This is 1,341 visitor days (770 percent) over the area's current estimated 200 annual visitor days. Management provided through a Wilderness Management Plan would regulate destructive increases in future recreation use; however, due to the relatively small size and narrow canyon configuration of the WSA, the quality of the primitive recreation experience could be negatively affected by the increased use unless the use is spread throughout the year. Use of ORVs in the Cheesebox Canyon WSA is minimal and closure of the WSA to vehicle use would result in little change from the current situation. Although 1-day hiking tours could be sponsored, commercial outfitting would not benefit significantly from wilderness designation because opportunities for commercial enterprise are limited.

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Dark Canyon Complex

DARK CANYON COMPLEX
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DARK CANYON COMPLEX

INTRODUCTION

General Description of the Area

Originally the Dark Canyon Instant Study Area (ISA) was coincident with the boundaries of the existing Dark Canyon Primitive Area. That area and the Middle Point Wilderness Study Area (WSA) have been combined for this analysis because most of the boundary of Middle Point WSA is contiguous with that of Dark Canyon ISA (refer to Map 1). No roads or features separate the two. The existing Dark Canyon Primitive Area contains approximately 62,040 acres and the Middle Point WSA contains 5,990 acres of BLM-administered land. Together the two units comprise 68,030 acres of public land. For ease of reference the entire area is referred to in this document as the Dark Canyon Complex, ISA Complex, or ISA.

Dark Canyon is approximately 45 miles southwest of Moab, Utah and 30 miles west of Monticello, Utah. It is entirely within San Juan County.

The ISA Complex has a main portion and an isolated part to the north. This is because in the original Primitive Area withdrawal order (1970, U-12307) there were 74,317 acres of contiguous lands bordering on Lake Powell. When Congress established the Glen Canyon National Recreation Area (NRA) in 1972 (P.L. 92-593), the BLM Primitive Area was separated due to the inclusion of the middle part in the NRA.

The main (or southern) portion of the Primitive Area consists of a labyrinth canyon system occupying an irregular area that extends roughly 15 miles on both the east-west and north-south axis. The smaller portion lies about 2 miles to the north.

The southern portion is bounded on the west and northwest by the National Park Service (NPS) administratively endorsed (proposed) Dark Canyon Wilderness (18,100 acres) in Glen Canyon NRA. The southeastern most extremity of the unit is contiguous with the Dark Canyon Woodenshoe Wilderness Area, designated in 1984, in the Manti-LaSal National Forest (60,000 acres).

The isolated northern portion of the BLM Dark Canyon Primitive Area (2,000 acres) is north of Imperial Valley and Beef Basin and is contiguous with the Canyonlands National Park administratively endorsed Maze Wilderness on the north (105,980 acres) and the Glen Canyon NRA proposed Dark Canyon Wilderness on the west.

In the complex of canyons included within the Dark Canyon ISA, seven stand out as the most significant: Dark Canyon itself with tributaries of Black Steer, Youngs, Lost, and Lean-To Canyons. Separated from Dark Canyon there are the Bowdie Canyon and Gypsum Canyon/Fable Valley drainages. All the canyons are tributary to the Colorado River (Lake Powell).

Dark Canyon is a canyon of changing varied scenery and an important physical landmark of the area. The canyon winds through 13.7 miles of BLM Primitive Area. The canyon is about 2,000 feet deep throughout its length within the BLM Primitive Area. Dark Canyon begins near Elk Ridge to the east and empties into the upper end of Lake Powell to the west.

The upper reaches of the canyon are wide, with many large, open clearings. These upper drainages cut through the Cedar Mesa Sandstone Member of the Cutler Formation. Here, the canyon has red-and-white banded walls with occasional buff hues.

Near the BLM/Forest Service (FS) boundary, the ponderosa pine and Douglas fir trees give way to pinyon-juniper and cottonwoods. The canyon is generally sparsely vegetated with rocky ledges being its main feature. The limestone benching in Dark Canyon provides for easy hiking and beautiful waterfalls. The sense of being enclosed in numerous walls and ridges, each reaching higher than the one in front, stays with the hiker down the canyon but is gradually overshadowed in the lower reaches, as the innermost walls tower to a height of over 1,400 feet.

Dark Canyon is set apart from most other canyons in this region by an abundant supply of flowing water and deep plunge pools. This is a key natural resource which enhances both recreational values and wildlife habitat.

Black Steer Canyon is the first major drainage encountered down Dark Canyon from its junction with Woodenshoe Canyon. It is a narrow canyon with walls 1,400 feet high. The canyon bottom is covered with rocks near the mouth. There are occasional springs in Black Steer Canyon with associated willows, cattails, and rushes.

STATEWIDE POCKET MAP
WSA NO. 51
SEE VOL. I

Youngs Canyon is the next encountered, coming in from the north. Where it meets Dark Canyon there is a 30-foot waterfall. There is flowing water for about 1 mile up from the mouth.

Lost Canyon is a southern tributary of Dark Canyon roughly 7 miles long. Lost Canyon is best characterized by its extreme variety. Gently sloping walls and wide valleys give way to narrows too steep and thin to walk in. The lower reaches of Lost Canyon drop rapidly forming sheer dark walls nearly 1,200 feet high. There is gray limestone near the mouth but it soon rises into the red and white of the Cedar Mesa Sandstone. Many alcoves, pinnacles, and buttes are visible on the walls along the skyline.

At the junction with Lean-To Canyon of Dark Canyon, the canyon opens up somewhat and the walls are sloping rather than sheer. The walls of Lean-To Canyon rise a sheer 1,500 feet from the streambed to the rim. Not only is this canyon deep, it is also narrow with a number of dry pour-offs, one being approximately 300 feet high. The canyon bottom varies between sandy wash and gravels, large boulders, and smooth limestone exposures. These factors combine to make Lean-To a scenic canyon.

Vegetation in the canyons is generally sparse. Cactus, pinyon-juniper, serviceberry, and other small shrubs are characteristic except around ground seeps or springs. Near water, Gambel's oak, cottonwoods, ferns, and other riparian types sometimes form thickets. Low pinyon-juniper forest covers most of the canyon rims and canyon valleys. Toward the rim areas over Dark Canyon tree cover diminishes and desert scrub and blackbrush become more dominant. A wide variety of typical desert shrubs is present.

Separated from the Dark Canyon drainage are the Bowdie Canyon and Gypsum Canyon/Fable Valley drainages.

Bowdie Canyon is an extensive drainage creating low meanders through sculptured slickrock. Bowdie Canyon is cut primarily though the white rock of the Cutler Formation. In Bowdie's lower third the red rock of the Elephant Canyon Formation and, to a limited extent, the Hermosa Formation become prominent. In its lowermost reaches Bowdie Canyon has high walls above over a narrow, rapidly dropping channel.

Gypsum Canyon is a dramatic canyon where the topography and geology are the main focus of attention. Gypsum Wash winds 5.9 miles through Dark Canyon Primitive Area. The scenic values are high in both the deep and narrow Gypsum Canyon and the more shallow, broad, Fable Valley.

Between Fable Valley and the Glen Canyon NRA boundary, the Gypsum Canyon is the most scenic. The inner canyon is cut some 800 feet deep through the redrock benches of the Elephant Canyon Formation and Hermosa Group. Here the canyon becomes its narrowest. Waterfalls are frequent and pools in the slickrock before and after waterfalls are common.

Fable Valley, a tributary of Gypsum Canyon, differs in being a wider and shallower valley. It runs 9.7 miles from Sweet Alice Spring to Gypsum Canyon. The 500-foot cliffs have talus slopes which grade the cliffs into the broad sage-covered valley floor. A 30-foot wash gully meanders through this alluvial valley. There are a number of small mesas or "islands" in this valley. Ponderosa pines are in the upper Fable Valley drainage, and some scattered pinyon-juniper in the mid section.

The Middle Point area is about 4 miles long and averages 2.50 miles wide. The area is situated on the extreme western end of the Dark Canyon Plateau. It consists of two sloping pinyon- and juniper-covered mesas separated by the upper drainage of Rockfall Canyon that, west of the unit, drops 2,200 feet in 3 miles to meet Lake Powell in Cataract Canyon. From Middle Point this canyon passes through Dark Canyon Primitive Area (ISA) and Glen Canyon NRA.

The two mesas, Middle Point and Lean-to Point, slope to the west from 6,500 feet down to 6,000 feet. They are covered with moderately dense pinyon and juniper with occasional clearings of sage.

Information on the climate of the ISA Complex is based on the nearest weather station at Natural Bridges National Monument, about 25 air miles away from Dark Canyon. The average annual temperature at Bridges is 51 degrees Farenheit (F), with an average low of 37 degrees F and an average high of 65 degrees F. The record low is -2 degrees F, and the record high is 101 degrees F. Annual precipitation ranges from 8 to 12 inches over Dark Canyon.

January, May, and June are the driest months. July, August, and December are the wettest months. Rainfall usually comes associated with thunderstorms which can be quite intense, producing flash flooding. Annual total snowfall ranges from 20 to 40 inches.

Specific Issues Identified in Scoping

General issues pertaining to the wilderness study are discussed in Volume I. Specific issues pertaining to the Dark Canyon Complex identified through formal public scoping (USDI, BLM, 1984) are as follows:

1. *Comment:* This ISA has a high erosion hazard and/or areas that could receive erosion control measures and should not be designated wilderness.

   Response: The erosion conditions are discussed in this document. Need for erosion control measures in the ISA has not been identified in BLM land-use and activity planning, and none are proposed; therefore, there would be no conflict with this aspect and wilderness designation.

2. *Comment:* The occurrence of the sensitive plant species *Erigeron kachinensis* in or near this ISA Complex should be considered in the decisionmaking process.

   Response: The BLM is committed to the protection of sensitive plant species in coordination with the Fish and Wildlife Service (FWS). Such plant species would be of concern with or without wilderness designation.

3. *Comment:* I am especially concerned about the bighorn sheep herd. Recreation use should be a second priority to preserving the bighorn sheep. The BLM deserves the most enthusiastic support for this recommendation.

   Response: The bighorn sheep herd preservation is an important consideration in current land management activities, and will continue as a significant element in future wildlife habitat programs. Wilderness designation could benefit the native population of bighorn sheep by promoting solitude.

4. *Comment:* The ISA's national significance is indicated by its selection as an important segment of the "Hike a Nation" transcontinental backpacking route.

   Response: The Primitive Area status is indicative of the high natural and cultural resource values of national significance.

5. *Comment:* The oil and gas potential of the ISA Complex is ranked low by Science Applications, Inc. (SAI, 1982). Based on proprietary information, representatives of the oil and gas industry believe the potential of the ISA Complex to be rated high. This information should be considered in the Draft Environmental Impact Statement (EIS).

   Response: At this time BLM has not made an independent assessment of geologic information gathered by oil and gas companies. The SAI (1982) report will be used as the reference on oil and gas potential for this EIS, but information provided by the oil and gas industry and available mineral investigation reports by the USDI, Geological Survey and Bureau of Mines will be reviewed by BLM prior to making final wilderness recommendations to the Secretary of the Interior.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated from Detailed Study

No alternatives were identified for this ISA during scoping other than those analyzed.

Alternatives Analyzed

Three alternatives are analyzed for this ISA: (1) No Action; (2) All Wilderness (68,030 acres); and (3) Partial Wilderness (62,040 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 68,030-acre Dark Canyon ISA Complex would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the Beef Basin Management Framework Plan (MFP) (USDI, BLM, 1973) until that plan is superseded by the San Juan Resource Management Plan (RMP) currently scheduled for completion in 1986. The State land within or adjacent to the ISA (refer to Map 1) has not been identified for special Federal acquisition through exchange or purchase; therefore, these lands are analyzed as remaining under existing State ownership. No private lands are within the ISA Complex.

The following are specific actions that would take place under this alternative:

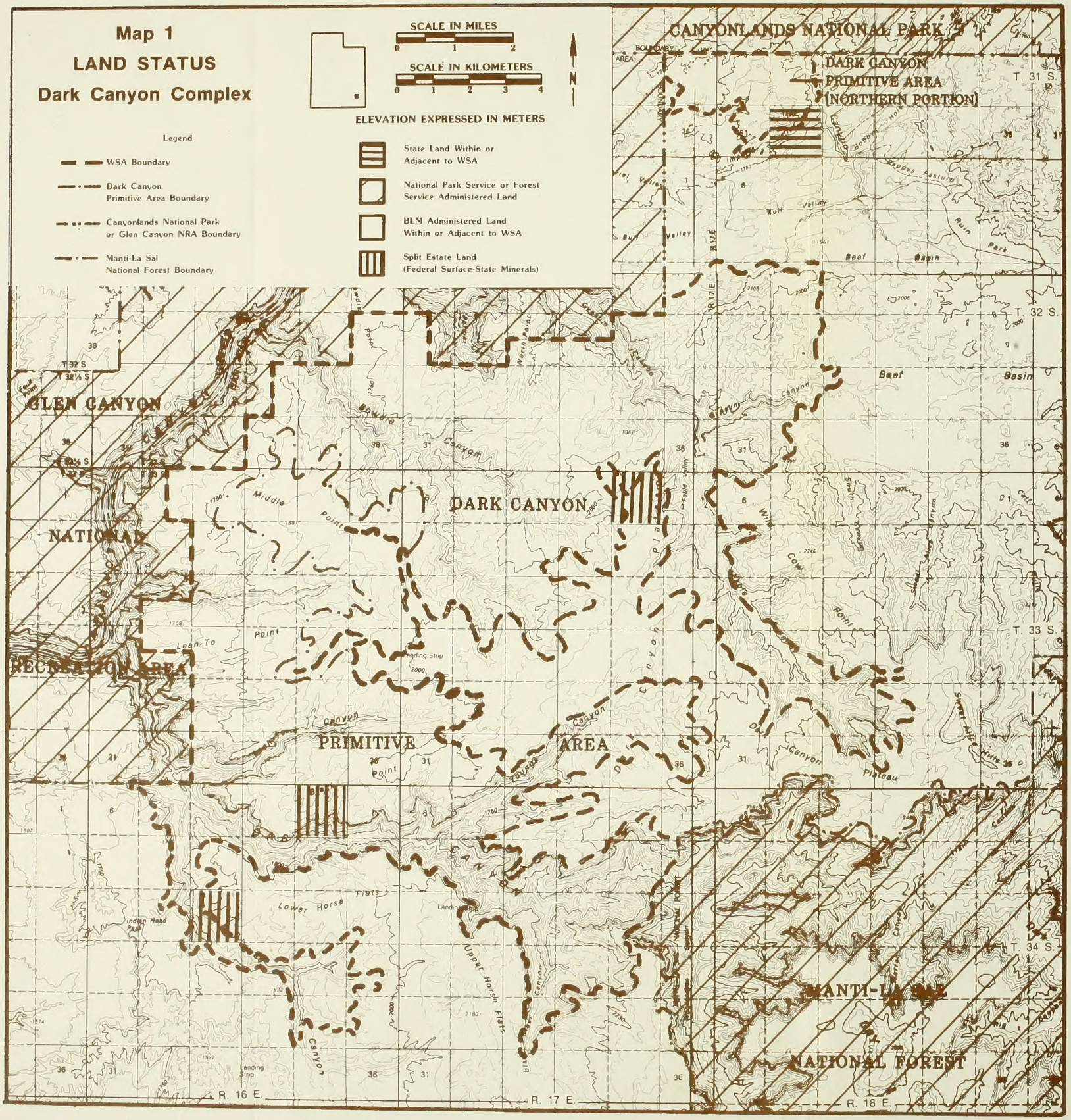
- The 62,040 acres of the Dark Canyon Primitive Area would remain closed to mineral

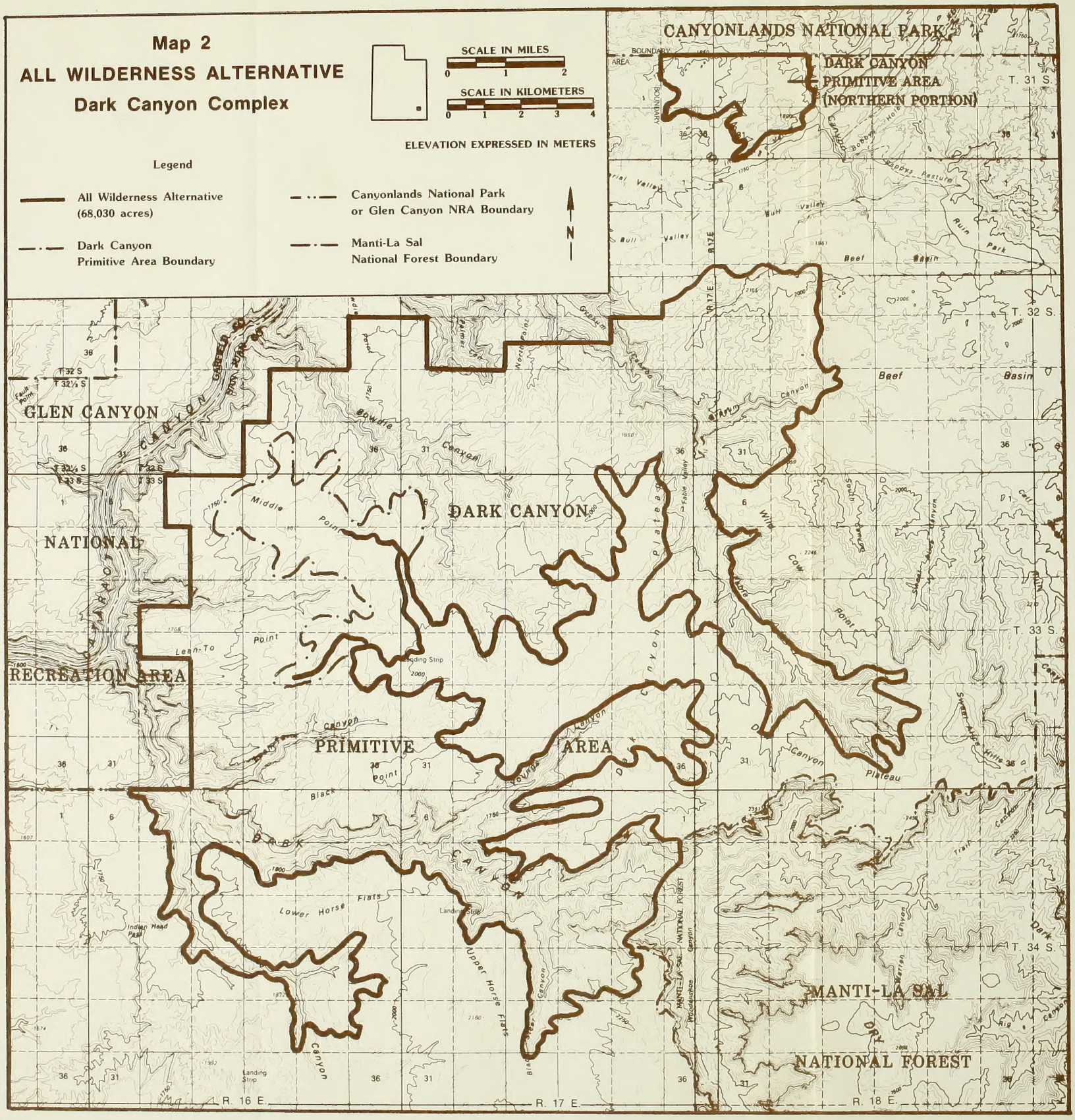
location, to mineral leasing, and to mineral sale. The Middle Point area of 5,990 acres would remain open to mineral location. Although no mining claims now exist, development work, extraction, and patenting would be allowed on any future valid mining claims in the 5,990-acre area. Development would be regulated by unnecessary or undue degradation regulations (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. There are no existing oil and gas leases. About 63,290 acres would remain closed to oil and gas leasing. The remaining 4,740 acres, located in the Middle Point area, would be open to leasing in Category 2 (standard and special stipulations). The special stipulations would be intended to protect deer winter range.

- The present level (844 Animal Unit Months [AUMs]) of domestic livestock grazing use of the 68,030-acre ISA Complex would continue as authorized in the MFP. Existing livestock developments (one spring development and an 80-acre seeding) could be maintained in a routine manner, with vehicle access. New rangeland developments could be implemented without wilderness considerations, although none currently are proposed.
- Developments for wildlife, watershed, water resources, etc. (except for one small pond, none exist and none are currently planned) would be allowed without concern for wilderness values if in conformance with the MFP. None now exist or are proposed.
- The 62,040 acres of the existing Primitive Area, including about 7.0 miles of ways and abandoned jeep trails, would remain closed to off-road vehicle (ORV) use. The remaining 5,990 acres in the Middle Point area, including about 0.5 mile of existing ways, would remain open to ORV travel. New access roads in the Middle Point area could be developed without wilderness considerations.
- The 62,040-acre Primitive Area is closed to woodland product harvest. Only the 5,990-acre Middle Point area would continue to be potentially open to woodland product harvest. There is no harvest of forest products at the present time, nor is any planned.
- The area would continue to be managed under Visual Resource Management (VRM) Class I (62,040 acres) and Class IV (5,990 acres).
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations. Use of vehicles for hunting would not be allowed in the 62,040 acres closed to ORV use.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.
- Under the No Action Alternative for wilderness, it is assumed that the existing Dark Canyon Primitive Area would not continue as a designated primitive area. It would, however, be considered for other special designation (e.g., Outstanding Natural Area [ONA] or Area of Critical Environmental Concern [ACEC]). It is assumed that current management actions (e.g., closure to mineral leasing and location and to ORV use) would continue. Management of the designated primitive area under another special designation would be a separate action that is not dependent on the wilderness review process and is not discussed further in this wilderness document, except as current management characteristics are integrated with the No Action Alternative.

ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under this alternative, all 68,030 acres of the Dark Canyon ISA Complex would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. One section of State land within the WSA would be exchanged.


Map 1
LAND STATUS
Dark Canyon Complex
SCALE IN MILES
0 1 2
SCALE IN KILOMETERS
0 1 2 3 4
N
ELEVATION EXPRESSED IN METERS
Legend
WSA Boundary
Dark Canyon Primitive Area Boundary
Canyonlands National Park or Glen Canyon NRA Boundary
Manti-La Sal National Forest Boundary
State Land Within or Adjacent to WSA
National Park Service or Forest Service Administered Land
BLM Administered Land Within or Adjacent to WSA
Split Estate Land (Federal Surface-State Minerals)
CANYONLANDS NATIONAL PARK
DARK CANYON PRIMITIVE AREA (NORTHERN PORTION)
GLEN CANYON
NATIONAL
RECREATION AREA
DARK CANYON
PRIMITIVE AREA
MANTI-LA SAL
NATIONAL FOREST
T. 31 S.
T. 32 S.
T. 33 S.
T. 34 S.
R. 16 E.
R. 17 E.
R. 18 E.
Beef Basin
Lean-To Landing Strip
Indian Head Pass
Lower Horse Flats
Upper Horse Flats
Landing Strip


Map 2
ALL WILDERNESS ALTERNATIVE
Dark Canyon Complex
SCALE IN MILES
0 1 2
SCALE IN KILOMETERS
0 1 2 3 4
ELEVATION EXPRESSED IN METERS
Legend
All Wilderness Alternative (68,030 acres)
Canyonlands National Park or Glen Canyon NRA Boundary
Dark Canyon Primitive Area Boundary
Manti-La Sal National Forest Boundary
N
CANYONLANDS NATIONAL PARK
DARK CANYON PRIMITIVE AREA (NORTHERN PORTION)
GLEN CANYON NATIONAL RECREATION AREA
DARK CANYON PRIMITIVE AREA
MANTI-LA SAL NATIONAL FOREST
T. 31 S.
T. 32 S.
T. 33 S.
T. 34 S.
R. 16 E.
R. 17 E.
R. 18 E.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 68,030 acres would be withdrawn from mineral location and closed to new mineral leasing and mineral sale (62,040 acres are already withdrawn). Although no mining claims now exist, development work, extraction, and patenting would be allowed to continue on any valid mining claims that may be located in the Middle Point area prior to wilderness designation. It is assumed that some such claims may be located. Any mining development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809) with concern for wilderness values. There are no existing oil and gas leases and no new leases would be issued.
- The present level of domestic livestock grazing would be allowed to continue as authorized in the Beef Basin MFP until that plan is superseded by the San Juan RMP scheduled for completion in 1986. The 844 AUMs in the ISA Complex would remain available to livestock as presently allotted. The use and maintenance of rangeland developments existing at the time of designation (one spring project and an 80-acre seeding) could continue based on practical necessity and reasonableness. After designation, new rangeland developments would be allowed on a case-by-case basis if necessary for resource protection (rangeland and/or wilderness) and the effective management of these resources, provided that wilderness protection standards are met (refer to Appendix 1). New range developments currently are not planned.
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are presently planned.
- Wildlife transplants and developments (except for a small pond, none now exist or are proposed) would be allowed as long as criteria are met to adequately protect wilderness values (refer to Appendix 1).
- The entire 68,030-acre area would be closed to ORV use except for users with valid existing rights if approved by BLM in accordance with 43 CFR provisions. About 7.5 miles of existing vehicular ways would not be available (7 miles of these ways currently are not available) for vehicular use except as indicated above. About 8 miles of the ISA Complex boundary follow existing dirt roads and these would remain open to vehicular travel. Two roads totaling about 6 miles on Middle Point and Lean-to Point would be "cherry-stemmed" and remain open to vehicle use.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 68,030-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed for roads that are adjacent to or "cherry-stemmed" into the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed in the 68,030-acre area except for harvest of pinyon nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products at the present time, nor is any specifically planned.
- Visual resources on 68,030 acres would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease within the 68,030-acre area would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources in the 68,030-acre wilderness area would be allowed by permit provided it is carried on

in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.

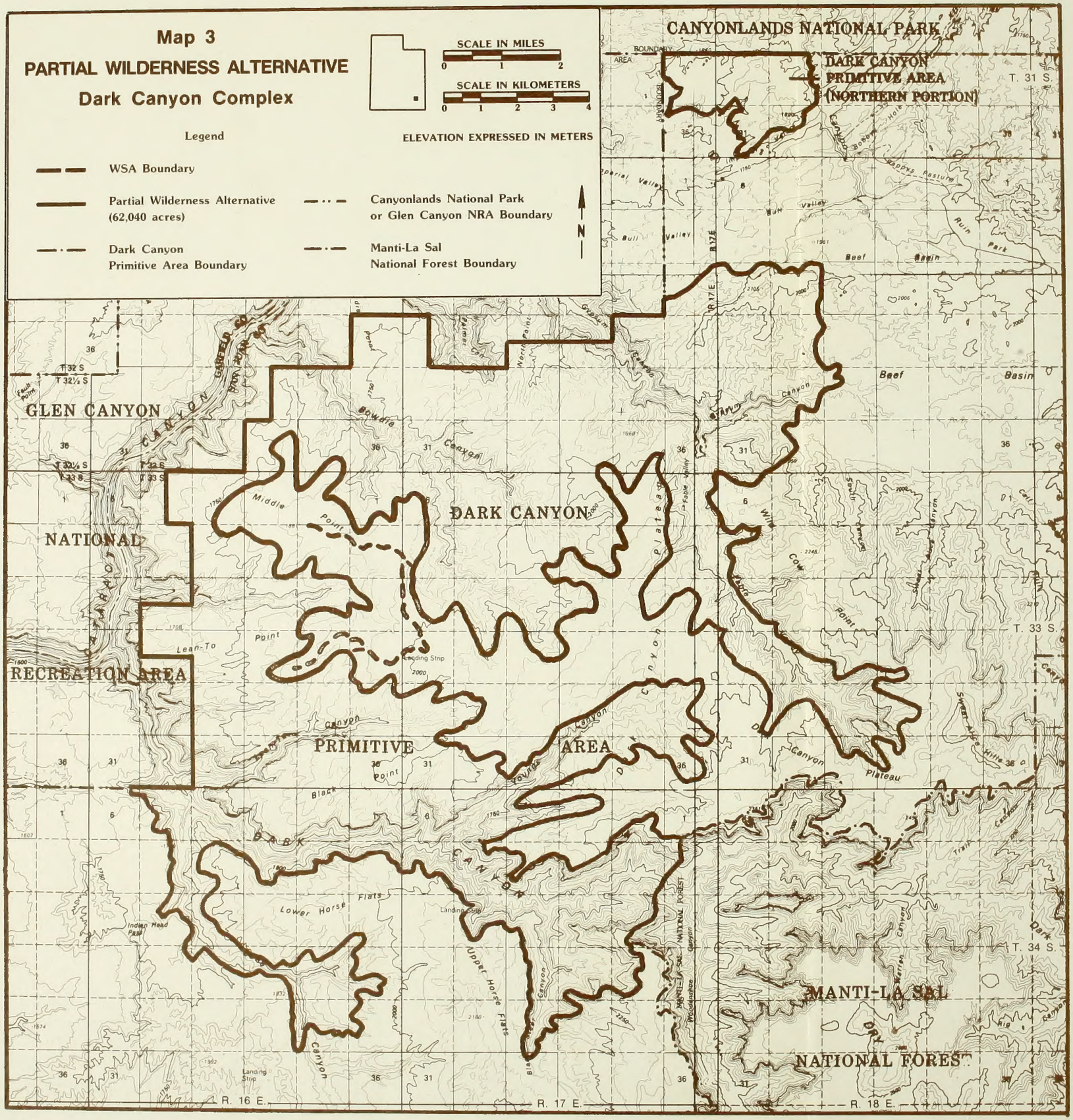
- Hunting would be allowed subject to applicable State and Federal laws and regulations but without the use of motorized vehicles.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. A predator control program would be approved only upon clear showing that removal of the offending predators would not diminish the wilderness values of the area.

PARTIAL WILDERNESS ALTERNATIVE

Under this alternative, 62,040 acres of the Dark Canyon ISA Complex would be designated as wilderness (refer to Map 3). The objective of this alternative is to analyze as wilderness that portion of the ISA Complex which is within the existing Dark Canyon Primitive Area. The acres analyzed as wilderness under this alternative include the steep canyon portions of the ISA. The 5,990 acres in the Middle Point and Lean-to Point area within the ISA but outside of that portion designated as wilderness would be managed in accordance with the Beef Basin MFP as described for the No Action Alternative. One section of State land within the WSA would be exchanged. The 62,040-acre area designated as wilderness would be managed in accordance with the BLM "Wilderness Management Policy" as described in the All Wilderness Alternative.

A summary of specific actions follows:

- The 62,040-acre wilderness would continue to be withdrawn from mineral entry and closed to new mineral leasing and mineral sale. There are no existing mining claims due to the existing withdrawal. The 62,040-acre area would continue to be closed to oil and gas leasing. There are no existing oil and gas leases or other leases. The 5,990-acre area within the ISA Complex not designated wilderness (refer to Map 3) would be open to future mineral location, leasing, and sale. In the 5,990-acre area, development work, extraction, and patenting of future mining claims could occur without wilderness consideration if claims are valid. The area not designated would be managed as oil and gas leasing Category 2 (standard and special stipulations) on 4,740 acres and Category 4 (closed to leasing) on 1,250 acres.
- Domestic livestock grazing would continue to occur in the 62,040-acre wilderness area. The 775 AUMs in the 62,040-acre area would remain available to livestock as presently allotted. There are no existing range developments to be maintained in this area. New rangeland facilities (none currently planned) could be allowed in the wilderness if necessary for protection and management of the rangeland and/or wilderness resource. In the 5,990-acre nonwilderness area, grazing use of 69 AUMs could continue, and existing range developments (one spring project and an 80-acre seeding) could be maintained in a routine manner. New rangeland developments (none currently planned) could be allowed in this area without concern for wilderness values.
- In the 62,040-acre wilderness, new water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed only if enhancing to wilderness, if necessary to correct conditions that are imminently hazardous to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act*. In the remaining 5,990-acre area, water resource facility developments would be allowed without concern for wilderness values if in accordance with the MFP. None are now proposed.
- In the 62,040-acre wilderness, wildlife transplants or habitat improvements would be allowed only if they are compatible with wilderness values. In the remaining 5,990-acre area, wildlife transplants or habitat improvements would be allowed without concern for wilderness values. None are now proposed in either part of the ISA Complex.
- The canyons that would comprise the 62,040-acre wilderness would continue to be closed to ORV use. About 7 miles of


Map 3
PARTIAL WILDERNESS ALTERNATIVE
Dark Canyon Complex
SCALE IN MILES
0 1 2
SCALE IN KILOMETERS
0 1 2 3 4
ELEVATION EXPRESSED IN METERS
Legend
WSA Boundary
Partial Wilderness Alternative (62,040 acres)
Dark Canyon Primitive Area Boundary
Canyonlands National Park or Glen Canyon NRA Boundary
Manti-La Sal National Forest Boundary
N
CANYONLANDS NATIONAL PARK
DARK CANYON PRIMITIVE AREA (NORTHERN PORTION)
GLEN CANYON NATIONAL RECREATION AREA
DARK CANYON PRIMITIVE AREA
MANTI-LA SAL NATIONAL FOREST
T. 31 S.
T. 32 S.
T. 33 S.
T. 34 S.
R. 16 E.
R. 17 E.
R. 18 E.

existing ways (currently closed) would not be available for vehicular use except in situations described under the All Wilderness Alternative. The remainder of the unit, including the existing .5 mile of ways as well as the roads bordering the ISA, would remain open to vehicular travel. No roads would be "cherry-stemmed," as they would be within the 5,990-acre nondesignated area.

- A specific Wilderness Management Plan would be developed to govern use and protection of the 62,040-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products in the 62,040-acre wilderness would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. The remaining 5,990 acres would be open to commercial woodland harvest, although none is planned.
- Visual resources on the 62,040-acre wilderness would be managed in accordance with VRM Class I standards which generally allow for only natural ecological change. The remaining 5,990 acres would be managed as VRM Class IV.
- Within the 62,040-acre wilderness area, measures to control fire, insects, noxious weeds, or disease would be taken only in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques. In the 5,990-acre nonwilderness area, measures of control would be taken without wilderness considerations.
- In the 5,990-acre nonwilderness area, any activity for the purpose of gathering information about natural resources would be allowed by permit. In the 62,040-acre wilderness, such activity would be allowed by permit provided it was accomplished in a manner compatible with wilderness preservation. Information gathering would be limited to that conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- In the 5,990-acre area, hunting would be allowed subject to applicable State and Federal laws and regulations. In the 62,040-acre wilderness, hunting would be allowed subject to applicable laws and regulations, but would be limited to nonmotorized means.
- In the 5,990-acre area, control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious loss of domestic livestock. In the 62,040-acre wilderness, control of predators would be allowed to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, but only under conditions that would ensure minimum disturbance to wilderness values. Poison baits or cyanide guns would not be allowed.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to provide a comparison of the alternatives.

AFFECTED ENVIRONMENT

Air Quality

The closest air monitoring station to the ISA Complex is 37 miles southwest at Bullfrog Marina on Lake Powell. Particulate and sulfur dioxide concentrations are measured.

Only the short-term (24-hour) particulate standard has been exceeded at the Bullfrog station. The 24-hour violations were probably associated with conditions of high winds and blowing dust

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
DARK CANYON COMPLEX

Resource	Alternatives		
	No Action	All Wilderness (68,030 Acres) (Proposed Action)	Partial Wilderness Designation (62,040 Acres)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 0.3 million barrels of oil and 2 billion cubic feet of natural gas. Other mineral resources are not known to be present in the ISA.	Oil and gas likely would not be recovered. Due to the low likelihood of recovery of oil and gas, however, the loss of development opportunity would not be significant.	The effects would be the same as the No Action Alternative.
Wildlife	About 0.2 percent of the ISA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.	The effects would be the same as the No Action Alternative.
Livestock	Grazing of 844 AUMs and maintenance of existing developments would continue. New developments could be constructed; however, none are now proposed.	Grazing of 844 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. New developments proposed in the future might not be allowed.	The effects would be the same as the No Action Alternative.
Visual Resources	The quality of visual resources could be impaired on about 12 acres.	Visual quality would not be impaired.	The effects would be the same as the No Action Alternative.
Recreation	ORV use would continue on 0.5 mile of ways at current levels. Overall recreational use could increase from the present 4,535 visitor days per year to 6,739 over the next 20 years. About 12 acres of oil and gas-related disturbance could reduce the quality of primitive recreation.	The ISA, including 7.5 miles of ways, would be closed to ORV use. Recreational use could increase by an undetermined amount, but estimated at up to 17,008 visitor days per year over the next 20 years, due to publicity associated with wilderness designation.	ORV use could continue on 0.5 mile of ways in the undesignated area. Overall recreational use might increase to 15,510 visitor days per year over the next 20 years.
Wilderness Values	Wilderness values could be lost on only 12 acres (0.02 percent of the ISA Complex).	Wilderness values would be protected, as they would not be likely to be disturbed by mineral-related activity.	The effects would be the same as the No Action Alternative. About 91 percent of the area meeting the standards for naturalness, outstanding opportunities for solitude, and outstanding opportunities for primitive recreation would be in the designated portion and would receive additional protection of wilderness designation.

TABLE 1 (CONTINUED)
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
DARK CANYON COMPLEX

Resource	Alternatives		
	No Action	All Wilderness (68,030 Acres) (Proposed Action)	Partial Wilderness Designation (62,040 Acres)
and Use lans and ontrols	This alternative would not be totally consistent with the San Juan County's concept of multiple use, but would be consistent with State of Utah plans and policies and the current BLM Beef Basin MFP. It would generally complement adjacent Forest Service and NPS wilderness management.	This alternative would not be consistent with San Juan County's concept of multiple use. It would complement the NPS and Forest Service proposals for nearby wilderness and would not conflict with State plans. Designation would constitute amendment of the BLM Beef Basin MFP or forthcoming San Juan RMP.	Consistency would be about the same as with the No Action Alternative. The portion not designated would be consistent with San Juan County's concept of multiple use.
ocio-conomics	Annual local sales of less than $35,474 and Federal revenues of up to $1,592 would continue. An additional $14,220 per year in Federal revenues could be derived from leasing of presently unleased areas.	Annual local sales of less than $35,474 and Federal revenues of up to $1,182 would continue. The opportunity for future energy and mineral leasing and development, along with local economic benefits and Federal revenues, would be reduced or lost in the ISA. Recreation-related income and revenues would probably increase over that associated with the No Action Alternative.	The effects of this alternative would be the same as for the No Action Alternative. Increases in recreation-related local income would be only slightly less than with the All Wilderness Alternative.

(resulting from the scarce vegetation and large areas of exposed sand). Sulfur dioxide concentrations measured at Bullfrog Marina are low and well under the applicable ambient standards.

Generally, the air quality is very good over the ISA Complex allowing for long vistas where topography and vegetation do not obstruct sightlines. Visual range in the general vicinity of the Dark Canyon ISA Complex averages between 100 and 132 miles during the summer (Aerocomp, Inc., 1984).

The ISA Complex has a Prevention of Significant Deterioration (PSD) Class II air quality classification under the provisions of the Clean Air Act as amended. This classification allows for moderate increases in air pollution levels. The Department of the Interior did recommend to Congress on September 7, 1979, pursuant to Section 164(d) of the Clean Air Act Amendment of 1977, that the Dark Canyon Primitive Area had air quality related values as important attributes of the area worthy of redesignation to Class I air quality. No action has been taken on this recommendation by the State of Utah.

Geology

The ISA is entirely within the Colorado Plateau Physiographic Province. This province straddles the Four Corners region and stands in sharp contrast to its surroundings. In this province the ISA is within the Canyonlands Section. The many canyons are precipitous, escarpments separate dry plateaus, and erosion has produced picturesque buttes, arches, and natural bridges. Several isolated peaks rise thousands of feet above the surrounding plateau.

The surface geology of the Dark Canyon ISA Complex consists almost entirely of flat-lying sedimentary rocks of the Cedar Mesa Sandstone Member of the Permian Cutler Formation (several arches and pinnacles occur in this member). Deep canyons have cut into the mesa exposing the underlying Elephant Canyon-Halgaito Shale and Hermosa Formations of Pennsylvanian Age.

The Cedar Mesa Sandstone Member is generally white, fine-grained, calcareous and cross-bedded. The Cedar Mesa Sandstone interfingers eastward with the Cutler Formation.

The Elephant Canyon-Halgaito Shale Formation underlying most of the area is a transitional unit composed of alternating marine and continental sediments 300 to 400 feet thick. It is a red and gray, thick- and thin-bedded unit composed of calcareous sandstone, sandy shale, persistent gray limestone, and sporadic purple arkose.

The Hermosa Formation in the vicinity of Dark Canyon probably represents the upper member of the Hermosa known as the Honaker Trail Formation. The Honaker Trail Formation includes those sediments between the Paradox Formation and the unconformably overlying Permian sequence; it consists of gray cherty limestone, interbedded with thin beds of slope-forming sandstone and lavender sandy shale. The formation is dolomitic in some areas.

Dark Canyon lies slightly west of the axis of the Monument Upwarp, a broad north-trending structural division of the Colorado Plateau, which extends 75 miles north of the Arizona border and plunges gently northward in and north of Dark Canyon. The upwarp is asymmetrical. It is bounded on the east by the north-trending Comb Monocline, with structural relief of about 2,500 feet. The western margin is structurally indistinct; the regional dip is gently inclined to the west and northwest.

Several gentle and minor anticlines, synclines, and monoclines have been mapped in the eastern portion of the ISA and to the southeast. Most trend northeast, north, and northwest and are superimposed on the Upwarp described above.

An arcuate swarm of near-vertical faults trending east, then swinging northeast, is the main structural feature of the northern part of the ISA and adjacent areas to the north. These faults, with minor displacements indicated by the surface topography, form a series of horsts and grabens cut by cross faults of similar displacement. Large blocks slumping along arcuate fractures are well displayed in upper Gypsum Canyon.

The topography of the Dark Canyon ISA Complex is one of sharp contrast between deep canyons and the gently westward sloping mesas that separate them. Elevation ranges from 7,700 feet above sea level on the mesa tops to 4,400 feet in the canyon bottoms.

There are three major canyon systems in the ISA Complex. Dark Canyon itself averages 2,000 feet deep, and with its tributaries, Black Steer, Young's, Lost and Lean-To Canyons, totals over 35 miles in length within the ISA. Gypsum Canyon ranges between 1,200 and 1,400 feet deep for most of its length and with its Fable Valley tributary totals a length of 15.6 miles within the ISA. Bowdie Canyon is 800 feet at its deepest point and 16.3 miles of it lie within Dark Canyon ISA Complex. The overall terrain of the area is extremely

rugged. The walls of the canyons are combinations of steep, rocky talus slopes and vertical cliffs which in places are less than 20 feet apart in the canyon bottoms. The canyons themselves are sinuous along their entire lengths with entrenched meanders evident from the canyon rims to the present streambed.

The Middle Point area is a topographic high point dividing three canyon heads. Bowdie Canyon lies to the north, Rockfall Canyon lies to the west and Lean-to Canyon forms the south boundary of the ISA. The ISA covers most of Middle Point and the eastern half of Lean-to Point. Elevation ranges from 6,600 feet at the southeast corner to 5,800 feet at the northwest corner.

Soils

The majority of the ISA consists of rock outcrop and shallow soils on the rims of canyons and mesas. Soils of the Middle Point area are shallow to very deep. On the steeper fans along canyon walls the soils are shallow to very deep loamy and stony soils. The soils have generally developed from eroded sandstone. Soil characteristics and land types are shown in Table 2.

Erosion is mostly naturally caused with losses from water erosion. Table 3 lists the erosion conditions in the ISA Complex.

Vegetation

The vegetation in the Dark Canyon ISA Complex is comprised of three main types: pinyon-juniper, blackbrush, or sagebrush (refer to Table 4).

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Bare Soil Surface
Shallow loamy soils on sloping structural benches and ledges	45	30,613	1	10
Rock Outcrop and Rubbleland	50	34,016	0	0
Deep and very deep loamy soils on gently sloping alluvial fans and valley floors	5	3,401	0.1	1
Totals	100	68,030		

Source: Hansen, 1985.

TABLE 3
Erosion Conditions

Erosion Class	Erosion Rate (cubic yards/acre/year)	Annual Soil Loss Under Present Conditions: Percent of Area	Acres	Cubic Yards	Annual Soil Loss if Disturbed: Percent of Area	Acres	Cubic Yards
Very High	20	0	0	0	0	0	0
High	10	0	0	0	10	6,803	68,030
Medium	5	0	0	0	35	23,810	119,050
Low	1	45	30,613	30,613	5	3,401	3,401
Very Low	0.1	5	3,401	340	0	0	0
None	0	50	34,016	—	50	34,016	—
Totals	—	100	68,030	30,953[1]	100	68,030	190,481[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: .45 under present conditions; 2.84 if disturbed.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of ISA
Pinyon-juniper	34,370	50
Blackbrush	33,020	49
Sagebrush	640	1
Totals	68,030	100

Source: USDI, BLM, 1968.

The pinyon-juniper woodland consists of mature trees with very little understory. In areas away from the canyon rims where the soil is deeper the understory is a mixture of sagebrush, blue grass, and Mormon tea.

The blackbrush vegetation type occurs on the steep canyon slopes. Blackbrush is the main plant with scattered Mormon tea, yucca, and curly grass on narrow benches. Within this type are the canyon bottoms which are mostly narrow slickrock areas with vegetation such as cottonwood, willow, tamarisk, sagebrush, rabbitbrush, oakbrush, skunkbrush, and goldenrod.

The sagebrush community in Fable Valley is predominately big sagebrush with fourwing saltbush and rubber rabbitbrush mixed in. Indian ricegrass and sand dropseed are found in the more open areas. Phragmite, a reed grass, is found in the wash bottom that runs the length of the valley. The sagebrush-grass type on Middle Point includes big sagebrush and crested wheatgrass. The crested wheatgrass was seeded in this area in

the late 1950s. Other species include bottlebrush, squirrel tail, winterfat, and young pinyon and juniper trees.

Douglas fir, Gambel's oak, and mountain mahogany are found scattered on north-facing slopes at the higher elevations. These plants are found in the pinyon-juniper and blackbrush vegetation types.

There are no areas mapped as riparian vegetation in the ISA Complex; however, riparian species do exist.

Vegetation can be amazingly dense in spots along the canyon bottom. Some seeps are so choked with trees, organic matter, and grasses that no water can be seen. These patches extend for up to 75 yards at a time, forming shady groves and dense "jungles" of reed grass, trailing virgins bower, and cottonwood.

There are no known threatened or endangered plant species in the ISA Complex. Two species (*Astragalus monumentalis, Erigeron kachinensis*) that may occur within the ISA Complex are being reviewed by the FWS for possible threatened or endangered status.

The Dark Canyon ISA Complex is in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) types of the ISA Complex are shown in Table 5. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 5
Potential Natural Vegetation Types

PNV Type	Acres	Percent of ISA
Juniper-pinyon woodland	24,820	36
Blackbrush	43,210	64
Totals	68,030	100

Source: USDI, Geological Survey, 1978.

Water Resources

Dark Canyon contains year-round flowing water from about Black Steer Canyon down 10 miles into the ISA. Upper Dark Canyon and the other canyon systems contain seasonal water flows as well as springs and seeps. Water is a limited resource in the Middle Point area. There are no water wells or reservoirs within the boundaries of the ISA Complex. One developed spring with a livestock watering trough is located in the ISA Complex. Intermittently, this spring is also utilized by wildlife and recreationists. There are seasonal pools of water along the slickrock rims. The water quality is generally good and is used by wildlife and recreationists.

Mineral and Energy Resources

The BLM, in consultation with the U.S. Department of Energy, had each WSA within Utah independently assessed for its energy and mineral resource values by SAI (1982). The energy and mineral resource rating is given in Table 6. Refer to Appendix 5 for a detailed description of the SAI rating system.

TABLE 6
Mineral and Energy Resource Rating Summary

	Rating		
Resource	Favorability[1]	Certainty[2]	Estimated Resource
Oil and Gas	f2	c1	Less than 10 million barrels of oil; less than 60 billion cubic feet of gas
Copper	f1	c1	None
Uranium/Vanadium	f1	c1	None
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydroelectric	f1	c4	None
Potash	f1	c3	None

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).

[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

The potential for mineral resources in this WSA is low due to a marginally favorable geologic environment.

An overall importance rating (OIR) of 2 was assigned to the Dark Canyon area and an OIR of 1 for Middle Point area by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the mineral resource importance.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report for the ISA Complex. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. There are no minerals currently listed as strategic and critical found within the ISA Complex (Federal Emergency Management Agency, 1983).

LEASABLE MINERALS

Due to unfavorable geologic conditions it has been determined that no coal, potash, geothermal, or other leasable resources are present in this ISA Complex (i.e., no tons of ore, units of energy, or surface acres underlaid with deposits). Also, no leases for these resources exist in the ISA Complex.

Oil and Gas

There has been no oil and gas production within the ISA to date, although six test wells have been drilled in the ISA Complex and nine nearby. One well was drilled in 1977, two in 1968, and 12 from 1956 to 1960. Oil-stained cores from the Paradox Formation were recovered from three wells, and similar cores from the underlying Mississippian Limestone were recovered in one well. Most wells bottomed in the Mississippian, three in the Cambrian, and one in the pre-Cambrian. The target in most cases was the Paradox, the major producer in the Aneth Field about 50 miles to the southeast.

Although favorable beds of the Paradox Formation crop out or underlie the ISA their potential for containing oil is low. Broad uplifts beginning in late Cretaceous time have caused the overlying Mesozoic sedimentary rocks to be eroded away. As a result of erosion approximately 300 feet of the Paradox Formation and about 800 feet of the upper part of the Hermosa Group, are now exposed within the tract along Gypsum Canyon. It is, therefore, very unlikely that reservoir pressure exists in Pennsylvanian rocks in this area. If oil and/or gas existed in the Paradox Formation and overlying units in Dark Canyon, there is a good chance that it has drained away.

In summary, the oil and gas favorability of Dark Canyon and Middle Point is considered low because of deep erosion that probably resulted in the loss of hydrocarbons and the loss of reservoir pressure. Small fields, nevertheless, may exist in stratigraphic and structural traps in Pennsylvanian rocks, and perhaps in Mississippian rocks. The low rating indicates a potential for less than 10 million barrels of oil or less than 60 billion cubic feet of gas (in-place), with less than 3 million barrels of oil and less than 18 billion cubic feet of gas considered potentially recoverable.

All of the Primitive Area (62,040 acres) is within oil and gas leasing Category 4 (closed to leasing). There are currently no oil and gas leases issued within the Middle Point area. Approximately 4,740 acres are in leasing Category 2 with special stipulations for protecting the Beef Basin deer winter range. The remaining 1,250 acres are in leasing Category 4 and are not open to leasing because Middle Point shares 85 percent of its boundary with the Dark Canyon Primitive Area where no leasing occurs. In the ISA Complex a total of 63,290 acres are in Category 4 and 4,470 acres in Category 2.

LOCATABLE MINERALS

The locatable mineral potential of the ISA Complex is considered very low. Due to geologic unfavorability, no deposits are known to be present.

The ISA Complex does not lie within an organized mining district. No mining claims are known to have been located within the ISA Complex. The Primitive Area (62,040 acres) has been withdrawn from mining location since 1970. The Middle Point area is open to mineral location (5,990 acres).

SALABLE MINERALS

The salable minerals within the ISA Complex (sand and gravel) are of limited potential due to their remote location and presence of adequate supplies elsewhere in the region.

Wildlife

The ISA Complex provides a diversity of habitat types for animals commonly found in rocky, pinyon-juniper environments.

Mule deer inhabit some of the canyons yearlong. The majority of the deer use occurs from October through April. None of the ISA Complex has been identified as crucial deer winter range; however, mule deer winter on Middle Point from November to April.

There are no existing or proposed wildlife management facilities or treatments in the ISA Complex.

Dark Canyon, Lost Canyon, and Black Steer Canyon are within the BLM's White Canyon-Red Canyon Habitat Management Area. The rest of the Dark Canyon ISA Complex is within the Beef Basin Habitat Management Area. All of the Primitive Area (62,040 acres) has been identified by BLM and the Utah Division of Wildlife Resources (UDWR) as crucial yearlong desert bighorn sheep habitat. Native populations of desert bighorn sheep in these canyons appear to be declining over the past 5 years.

Mountain lion and bobcat inhabit the remote canyons where they are seldom seen. Spotted skunk and ringtail cat are found in the wetter canyons. Cottontail rabbit, whitetail antelope squirrel, chipmunk, deer mice, pinyon mice, whitethroat woodrat, porcupine, and assorted bats are found within the ISA Complex.

There is no waterfowl habitat within the ISA Complex, but mourning dove and chukar nest there. The greatest diversity of nongame birds is found in the canyons during the spring migration. White-throated swift, broadtailed hummingbird, hairy woodpecker, ash-throated flycatcher, violet-green swallow, common raven, pinyon jay, plain titmouse, bushtit, canyon wren, mountain bluebird, blue-gray gnatcatcher, black-throated gray warbler, rufus-sided towhee, black-throated sparrow, and chipping sparrow are found in the ISA. Cooper's hawk, red-tailed hawk, American kestrel, and great horned owl are also in the area.

The most common reptile and amphibian species within the ISA Complex are the Great Basin spadefoot toad, red-spotted toad, side-blotched lizard, northern plateau lizard, leopard lizard, collared lizard, tree lizard, and Hopi rattlesnake. There are no fish species in the ISA Complex.

Threatened and endangered wildlife species include bald eagle which are winter transients in the vicinity of the ISA Complex; however, no roosting sites have been identified. Peregrine falcons may utilize these canyons, but no aeries have been observed. Other than the possibility of peregrine falcons, the FWS has not identified any other threatened or endangered species nor critical habitat for these species in the ISA Complex.

Forest Resources

Approximately 34,370 acres of pinyon-juniper woodland are within the ISA Complex. These are low-quality sites (20 cubic feet usable wood per acre) and are considered nonproductive forest land. Pulp and papermaking opportunities are low. No areas near this ISA Complex have been designated as Christmas tree cutting areas. There is less than an estimated 5,298 cords of firewood in the ISA Complex.

No free-use firewood permits or permits for juniper posts have been issued in Dark Canyon due to the Primitive Area designation. Also, due to the limited access and distance to Middle Point from population centers, firewood and pinyon post gathering use here is very limited.

Pine nuts are collected by some recreationists, but there has been no commercial gathering near this area.

Livestock and Wild Horses/Burros

The ISA Complex contains a total of 844 AUMs in portions of two grazing allotments: Indian Creek and White Canyon (refer to Table 7).

TABLE 7
Livestock Grazing Use Data

	Allotments	
	Indian Creek	White Canyon
Class and Number of Livestock	1,065 Cattle	450 Cattle 12 Horses
Number of Operators	1	1
Season of Use	10/16 to 6/16	3/1 to 2/28
Total AUMs	8,518	5,544
AUMs in ISA	836	8
Total Acres	236,890	248,757
Acres in ISA	59,980	8,050
Percent of Allotment in ISA	26	3

Source: USDI, BLM, 1968.

Grazing in the Dark Canyon ISA Complex portion of the Indian Creek Allotment is primarily during winter and spring. It is estimated that there are approximately 767 AUMs of forage produced in the Primitive Area portion of the Indian Creek Allotment. Estimated grazing use is by 118 cattle for a 6 1/5-month grazing season. However, actual grazing use may be much less because of limited forage and distance from water.

Estimated forage production in the Middle Point area, within the Indian Creek Allotment, is approximately 69 AUMs. Estimated grazing use is about 17 cattle in winter and spring (December 1 through May 31). This estimated use period is dependent on weather conditions.

Grazing in the Dark Canyon ISA Complex portion of the White Canyon Allotment is primarily during the spring (April 1 to May 30) and fall (November 1 to December 30). It is estimated there are approximately eight AUMs of forage produced in the White Canyon portion of the ISA. Estimated grazing use is by two head of livestock for the 4-month grazing season.

There are no range developments within the Dark Canyon Primitive Area. Rough terrain and shallow soils make most improvements infeasible.

Range improvements within the Middle Point area include a crested wheatgrass seeding of about 80 acres done in 1956 and a developed spring (Pete's Spring). The "cherry-stemmed" roads on Middle Point and Lean-to Point are used in grazing management, access to the vicinity of Pete's Spring, and access to a range trend study in Section 2. There are no new range developments proposed for the ISA Complex.

There are no wild horses or burros within the ISA.

No other agricultural activity takes place within the ISA Complex. Rough terrain, shallow soil, and limited rainfall would make agricultural activity impractical.

Visual Resources

The 62,040 acres of the Dark Canyon Primitive Area have been given a VRM Class I rating, which provides primarily for natural ecological change; however, it does not preclude very limited management activity. The activity must not attract attention in the characteristic environment. The VRM Class is determined by combining the scenic quality, sensitivity level, and distance zone.

The 5,990 acres of the Middle Point area are in VRM Class IV, where the contrasts may attract attention and be a dominant feature of the landscape.

The entire Dark Canyon Primitive Area contains Class A scenery. Class A scenery combines the most outstanding characteristics of the physiographic region. The Middle Point area contains 5,990 acres of Class B scenery. Class B scenery combines some outstanding features and some that are fairly common to the physiographic region. (Refer to Appendix 7 for a description of BLM's VRM rating system.)

The landscape character of the ISA Complex is composed of three principal canyon systems: Dark Canyon (with its tributary canyons), Bowdie Canyon, and Gypsum Canyon-Fable Valley. All three canyon systems have similar topography and landscape features.

The primary landscape features are abrupt deep canyons with interesting rock formations and high rock ledges, crags, and palisades. Much of the scenery is not easily accessible to view. The rock formations are pinnacled, smooth, and in places, very rugged in form. A great deal of color contrast exists in the rock and landforms, with the rock colors ranging from light tans and reds to dark reds. The soils are tan to light red. Textures of the rock are coarse, while the soils are smooth.

The character of the Middle Point area consists of the end of a plateau top jutting into Dark Canyon Primitive Area from the east. The end of the plateau top is divided into Middle Point in the north and Lean-To Point in the south.

Visual contrast is provided by diverse vegetation including sparse stands of pinyon-juniper on the talus slopes and rock ledges, with an understory of sagebrush, blackbrush, and rabbitbrush. In the Middle Point area, pinyon-juniper stands are moderately dense having clearings with sagebrush, blackbrush, winterfat, crested wheatgrass, and Indian ricegrass.

Dark-green stands of Douglas fir are present in the upper ends of the canyons. Riparian areas vary from dark to light green to gray-green and textures are coarse to fine. The clumps of pinyon-juniper provide color contrasts with the light-colored soil.

Three types of modifications have been identified within the ISA Complex boundaries: ways, hiking trails, and a chaining. These modifications create a low degree of visual contrast; they can be seen but do not attract attention.

Cultural Resources

Little archaeological work has been conducted in the Dark Canyon area. A reconnaissance in 1958, a brief survey of the Dark Canyon Plateau in 1967, and a 1-percent sample survey in 1977 have provided limited cultural resource data for the area.

A literature search revealed 32 recorded sites. The relative lack of inventory has led to a limited amount of site information concerning the ISA Complex. There appears to be a predominance of

Pueblo II and Pueblo III cultural manifestations. Most of these sites are cliff dwellings, which include habitation and/or storage structures (granaries). This is largely because most of the Dark Canyon ISA Complex consists of canyons as opposed to mesa tops. Because of the inaccessibility of Dark Canyon, this ISA Complex potentially contains numerous pristine cultural resources.

The Middle Point area consists primarily of high mesa topography. In mesa top landforms such as this, less permanent type sites associated with hunting, gathering, and farming would be expected to be found.

Historic activity in the ISA Complex primarily relates to use of the range for cattle and sheep grazing. Physical evidence remaining from this land use includes a stock trail (Fable Valley), a corral (Fable Valley), and cowboy camps (trash scatters as well as rooms built into caves).

There are no existing National Register sites and/or nominations in this ISA Complex. However, based on estimates from similar settings in the area, it could be expected that up to 2,658 sites could be located in the ISA Complex, an estimated 1,773 of which could be eligible for National Register status.

Recreation

The Dark Canyon ISA Complex provides recreationists with outstanding opportunities for backpacking and camping. Dark Canyon has been described as a miniature Grand Canyon. The remoteness and solitude of the area provides and draws individuals to significant primitive recreation experiences.

Most of the visitor use information was collected from the register boxes located at different trailheads into Dark Canyon. Register boxes are located at the Sundance Trail, Trail Canyon, and Beef Basin. Statistics from 1980 to 1984 indicate recent visitor use in Dark Canyon. Recorded annual visitation for that period is as follows: 1980, 2,279; 1981, 4,308; 1982, 2,402; 1983, 2,531; and 1984, 2,730. These data are only partially complete but give some indications of use. Actual use is probably up to twice the amount of recorded use.

The visitation to the ISA Complex occurs during the spring and fall seasons due to the availability of water and the moderate temperatures.

Access into Dark Canyon is difficult. The Sundance Trail, the most popular access point on BLM-administered land, descends a steep talus slope. The elevation at the trailhead is 5,400 feet, the bottom of the trail is near 4,200 feet. The 1,200-foot descent occurs in less than 1 mile. The trail is marked by carins at strategic points to aid in locating the trail.

Trail Canyon, Youngs Canyon, and Black Steer Canyon also provide access into Dark Canyon. These difficult trails have little identifications as they traverse down steep talus slope ledges and boulder fields. Once the bottom of the canyon is reached boulder fields and large and small pour-offs must be circumnavigated while hiking the canyon.

The least difficult access originates to the east in the Manti-LaSal National Forest or to the west in Glen Canyon NRA. The figures mentioned previously do not reflect the visitor use originating at these access points. Lake Powell offers the visitor boating access to the lower portion of Dark Canyon within Glen Canyon NRA. The upper portion of Dark Canyon and Woodenshoe Canyon in the national forest provide fairly easy access routes into the upper reaches of Dark Canyon in the ISA Complex.

The Bowdie and Gypsum Canyons currently receive little recreation use due to their remoteness and lack of defined access.

No surveys have been completed on hunting statistics; however, it is estimated that, in an average hunting season, 10 hunters spend about 125 days in pursuit of desert bighorn sheep in the Dark Canyon ISA Complex. Some of the bighorn sheep hunting may involve the use of commercial guide service. Prior to closing the deer hunt in this area in 1980, deer hunting pressure had been light to moderate on the mesa tops with a few hunters in the heads of the canyons. The ISA Complex is part of UDWR's North San Juan Bighorn Sheep Hunting Unit (No. 700).

There is potential for ORV use in the ISA Complex off the roads on Middle Point. However, steep canyons and pinyon-juniper woodland restrict this potential to open areas on the plateau. Little ORV use (estimated at less than 100 user days/year) currently occurs in the ISA Complex.

The overall recreational use of the ISA Complex is currently estimated to average about 4,535 visitor days annually, including a small amount (410 visitor days) of use related to nonlocal commercial outfitters. Approximately 95 percent of the use is attributed to primitive activities and approximately 5 percent is attributed to recreational activities (i.e., hunting, sightseeing, and ORV use) that currently utilize vehicular access on existing ways.

Wilderness Values

SIZE

The Dark Canyon ISA Complex contains 68,030 acres of public land. This large size greatly enhances the wilderness values present. The main (or southern) part of the ISA Complex is about 15 miles long (north to south) and up to 15 miles wide (east to west).

NATURALNESS

Dark Canyon was declared a Primitive Area by the BLM in December of 1970 to protect its outstanding natural beauty and unspoiled condition. The area has only a few ways projecting short distances across the unit's boundary. For the most part the Primitive Area boundaries were drawn along the canyon rims. Thus, the steep and rugged terrain has precluded human influence and the land retains its primeval character.

The Dark Canyon Plateau was inventoried and seven ways were found to cross the primitive area boundaries. These are as follows:

1. Four-wheel drive vehicle tracks extend 1.3 miles through the separated northern portion of the Dark Canyon ISA Complex. The tracks continue for 0.7 mile into Canyonlands National Park.

2. Four-wheel drive tracks protrude 0.2 mile to a small campsite and small arch at the head of Gypsum Canyon.

3. A way, maintained only by the travel of vehicles, enters the area for 0.4 mile at the head of Gypsum Canyon.

4. A way cuts through sparse pinyon-juniper at the head of Bowdie Canyon. It forks within the unit, the north fork being 0.4 mile and the south fork 0.3 mile long.

5. In a BLM Cooperative Agreement a road was constructed from Wild Cow Point into Fable Valley (Project No. 0687). It was completed in 1958 but sometime before 1977 a rockslide blocked vehicle travel into the Primitive Area. Considered a way beyond the rockslide, it protrudes 2.5 miles into the Fable Valley arm of the ISA. It consists of eroded wheel tracks, quite overgrown in places. There has been no recent travel on this way.

6. A once constructed way, now badly eroded, leads to the head of a cowtrail into Fable Valley. It enters the ISA for only 0.1 mile.

7. Wheel tracks wind among the pinyon-juniper trees out Black Point for 1.8 miles into the unit. A ledge, dropping perhaps 50 feet, stops travel beyond that point.

The majority of the Middle Point area appears predominantly natural, free of human imprints. A road forms part of the unit's eastern border, then is "cherry-stemmed" for 3 miles out Middle Point. Another road forms part of the unit's southern boundary, then is "cherry-stemmed" for 3 miles out Lean-To Point. These seldom-traveled dirt roads are thus not within the ISA Complex. Imprints within the ISA Complex are a chaining, an old Geological Survey Vertical Angle Bench Mark, a drill pad site and a developed spring and associated way. Vehicle tracks also fork off the southern road for approximately .50 mile and are a minor imprint.

The chaining at the end of the Middle Point road was done in 1956. Approximately 80 acres of sage flat with scattered pinyon and juniper trees were chained and seeded for improved livestock grazing. This 26-year-old chaining is no longer a substantial imprint. With deadfall decomposing and sage and young trees reestablishing, it appears to the average visitor as a natural sage flat.

In the northeast quarter of Section 11, Township 33 South, Range 16 East, adjacent to the "cherry-stemmed" road on Middle Point, is a drill pad site built in the 1960s. The site is marked by a steel drill hole plug and is revegetating with snakeweed and grasses. It is not a substantial imprint; the average visitor could easily overlook the pad and marker. Five other oil and gas wells in the ISA Complex have also been rehabilitated and are substantially unnoticeable.

A spring in a small drainage in Section 13, was improved sometime around 1960. The improvement consists of a buried cement collection box, about 30 feet of barbed-wire fencing, some buried ½-inch piping, and an 8-foot-square by 2-foot-deep metal reservoir. This spring development is situated in a small draw and is thus not noticeable beyond about a 100-foot radius. The spring is .50 mile west of the eastern boundary road and vehicle tracks have created a way between the spring and the road.

In summary, less than 1 percent of the ISA Complex is impacted by imprints of man. The entire 68,030 acres meet the naturalness criteria.

SOLITUDE

The 60,000 acres of deep and winding canyons of the Dark Canyon Primitive Area offer outstanding opportunities for solitude. A hiker in any of the canyons experiences the stillness and overwhelming sheer cliffs of the canyons that provide a separation from the influences of the modern world.

The deep, winding, and rugged canyons offer outstanding topographic screening. Vegetation enhances these opportunities by providing shelter from the sun and screening from other users. Offsite influences are essentially limited to the high-altitude airlines and their vapor trails. With such a lack of other influences, these jets sometimes stand out as a reminder of the outside world, intensifying one's feeling of remoteness.

On the higher, relatively flat terrain of the Middle Point area, moderately dense stands of pinyon-juniper forest provide screening for users. The Middle Point area is reached by over 30 miles of infrequently traveled dirt road and is inaccessible during the winter snowpack.

In summary, throughout the ISA Complex the opportunities for solitude meet the outstanding criterion for areas under wilderness review (68,030 acres).

PRIMITIVE AND UNCONFINED RECREATION

The opportunities for primitive and unconfined recreation are outstanding throughout the ISA Complex. The remote and rugged canyons cut through rock layers and mesas for a total of 75 miles. With this large canyon complex, the challenging terrain, and the unique and varied rock formations, recreationists find many possibilities for primitive and unconfined recreation. The remoteness of the area adds to the enjoyment of the primitive experience.

Among the outstanding opportunities present are hiking and camping associated activities such as backpacking, dayhiking, exploring, rock scrambling, horseback riding (in Fable Valley), swimming/wading in the running water and pools of the various canyons, and hunting. Some additional examples of primitive and unconfined recreation are photography, drawing, bird watching, and sightseeing for biological, zoological, and geological features.

In summary, the outstanding quality of the hiking, camping, and associated activities allow the entire ISA Complex (68,030 acres) to meet the outstanding recreation criterion set for areas under wilderness review.

SPECIAL FEATURES

The ISA Complex contains supplementary values of special interest. These include ancient Indian occupation, fossil inclusions in rock, wildlife habitat, historic cowboy use, and scenic values of deep canyons, sheer cliffs, and a few natural arches.

Anasazi Indian occupation in the ISA seems to have been somewhat sparse compared to canyons further south such as Grand Gulch. However, evidence such as cliff dwellings, granaries, petroglyphs, and lithic scatter does exist within the ISA. These features enhance the primitive recreation values present and add to the feeling of timelessness in these rugged and remote canyons. Thirty-two sites have been recorded and a potential 2,658 sites may exist in the ISA Complex.

Of geological interest are the limestone exposures with red chert nodule inclusions. The limestone also includes cockleshell and crinoid stem fossils. These limestone ledges make the deep and narrow lower Dark Canyon an especially scenic canyon due to their waterfall-producing effect. Groups of desert bighorn sheep are occasionally observed by hikers in the canyons of the ISA Complex and by boaters on the Colorado River just west of the unit. All of the major canyons in this ISA have been identified as crucial desert bighorn sheep habitat. Mule deer winter on Middle Point from November to April.

The bald eagle, an endangered species, is a winter transient in the vicinity of the WSA and peregrine falcon, also endangered, could occur in the ISA Complex. Also, mountain lion, or cougar, inhabits remote canyons in the unit. As the second largest North American cat and an inhabitant of wild and remote areas, the cougar has quite an aesthetic value. Most people highly value the sighting of one of these animals in the wild.

As has been previously noted, the deep canyon, sheer and overhanging cliffs, and rock outcrops offer scenic values of outstanding quality. Unimpaired vistas from the unit enhance the wilderness values present. To the west are the Henry Mountains and the Orange Cliffs, to the north the lands of Canyonlands National Park, and to the east are the LaSal Mountains. Natural arches are not prevalent in the unit, but at least two are known.

Historic activity in the ISA Complex primarily relates to use of the range for cattle and sheep grazing. Physical evidence remaining from this land use includes a stock trail (Fable Valley), a

corral (Fable Valley), and cowboy camps (scatters of cans, bottles, and other debris). None of these facilities are functional.

Finally, the Colorado River, less than 1 mile west of the boundary of the ISA Complex, has recreational and historical values. Cataract Canyon is a popular whitewater rafting run through "big drops" and spectacular canyon country. Lake Powell, reaching to the vicinity of Gypsum Canyon, allows boating access to the major canyons of Dark Canyon ISA Complex.

Land Use Plans and Controls

All lands within the ISA Complex are public lands administered by the BLM. The ISA Complex is bounded on the north by Canyonlands National Park and Glen Canyon NRA; on the west by Glen Canyon NRA; and on the southeast corner by the Manti-LaSal National Forest. NPS has proposed a wilderness area in Canyonlands National Park on those lands adjacent to the portion of the ISA Complex on the north. The portion of the Manti-LaSal National Forest has been designated as wilderness on those lands adjacent to the ISA on the east. Glen Canyon NRA has a proposed wilderness area adjacent to the ISA on the west. All other boundaries of the ISA Complex are adjacent to public lands.

There are no rights-of-way within the ISA Complex.

Legal access is available by U.S. Highway 191, State Highway 211, and county roads only to the peripheries of the ISA. There are a minimum number of small trails leading into the area.

On December 2, 1970, under Withdrawal Order U-12307, the lands of Dark Canyon ISA Complex were withdrawn from all forms of appropriation, selection, location, and entry under the public land laws and designated as the Dark Canyon Primitive Area.

The Dark Canyon Primitive Area was designated a Primitive Area as a result of the multiple-use classification inventory process completed in 1968. The BLM Beef Basin MFP (1973) recognized the Primitive Area and made no further recommendations. Therefore, the same action has carried through and the area has been managed as a Primitive Area under BLM land use plans.

The *San Juan County Master Plan* (Planning and Research Associates, 1967) shows this area as open range/forest lands. The Master Plan predates wilderness considerations. The San Juan County Commission (1980) opposes further legislative or administrative designation of wilderness in the county.

Socioeconomics

DEMOGRAPHICS

The ISA Complex is in west-central San Juan County. The nearest communities are Blanding and Monticello. Socioeconomic effects of designation would be confined mostly to San Juan County, which can be summarized as rural and sparsely populated.

San Juan County had a 1982 population of 12,700, not quite 1 percent of the State population (University of Utah, Bureau of Economic and Business Research, 1982). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers: Monticello, the county seat, had a 1980 population of 1,930; and Blanding, about 20 miles south, had a 1980 population of 3,120 (U.S. Department of Commerce [USDC], Bureau of the Census, 1981).

San Juan County is the largest county in Utah, comprising 7,885 square miles (about the size of New Jersey). About 86 percent of the county is owned by the Federal Government, 6 percent by the State, and 8 percent by private landowners (University of Utah, Bureau of Economic and Business Research, 1982). The southern 20 miles of the county comprise the Navajo Indian Reservation.

EMPLOYMENT

Even though local employment in the mining industry has decreased by 20 percent between 1980 and 1982 due to a downturn in local uranium mining and milling, it still remains the largest local private employer (Utah Department of Employment Security, 1983).

Recent statistics indicate that mining directly accounts for half of the income and 32 percent of the employment in the county (refer to Table 8). Because the mine operators and mine employees both purchase local products, mining's total local importance is greater. Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are on welfare and do not show up on unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

TABLE 8

1982 Employment and Income
San Juan County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance, and Real Estate	1	1
Services	8	11
Other	—	—
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	96
Unemployment (1st Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

NOTE: Because of rounding, numbers are not additive. Employment percent figures include only wage and salary employment. The relative importance of farm employment is therefore underrated. Tourism is included as part of Services, Retail Trade, and Other Services.

INCOME AND REVENUES

Activities in the ISA Complex that could be of any local economic consequence include livestock production, hunting, and dispersed nonmotorized recreation. Table 9 summarizes local income and Federal revenues from the ISA Complex. Appendix 9 identifies the multipliers used to estimate income and revenues.

TABLE 9

Local Sales and Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	None
Mining Claim Assessment	None	None
Mineral Production	None	None
Livestock Grazing	$16,880	$1,182
Recreational Use	Less than $18,594	$410
Total	Less than $35,474	Up to $1,592

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total local income that would be generated by these expenditures.

The ISA Complex has no mining claims or oil and gas leases; therefore, no income or revenues are generated from these potential resources.

It is estimated that the AUMs produced within the Dark Canyon ISA Complex account for $16,880 in livestock sales, including $4,220 in ranchers' return on labor and investment.

Fifteen test oil and gas wells have been drilled in the ISA Complex over the past 21 years. No production is currently taking place in the ISA Complex.

The two livestock grazing permittees in the ISA Complex can use up to 844 AUMs per year. Based on a $1.40 per AUM grazing fee, the ISA Complex can potentially generate $1,182 of Federal revenues annually, 50 percent of which would be allocated back to the local BLM district for the construction of rangeland improvements.

The actual amount of income generated locally from recreational use in the ISA Complex is unknown. However, an approximate range of expenditures can be deduced (Dalton, 1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for Dark Canyon ISA Complex is estimated as about 4,535 visitor days per year, for a total estimated income of $18,594. Only a portion of the expenditures for recreational use of the ISA Complex contributes to the local economy of San Juan County. (Local income related to hunting is included along with other recreation uses.)

Included in the recreation use are an estimated 410 visitor days attributable to commercial outfitters (including bighorn sheep hunting guide service). This use has an estimated $20,500 income to nonlocal business and $410 in Federal revenues.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines For All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section of this document.

2. Future users in the ISA Complex would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

It is assumed that the existing Dark Canyon Primitive Area would not continue as a Primitive Area. It would, however, be considered for other special designation (i.e., ONA or ACEC). It is assumed that current management actions (e.g., closure to mineral leasing and location and to ORV use) would continue as discussed in the description of the No Action Alternative.

The major changes that could occur in the area would be related to oil, gas, and locatable mineral exploration and development in the Middle Point area. The area would be open to resource use and development without control for wilderness protection. The degree of future development is unknown but would probably be relatively low due to the ISA's rough terrain and low resource potential. The following is a worst-case analysis, based on the assumption that oil and gas would be developed sometime in the future and would result in about 12 acres of disturbance. (Appendix 10 lists surface disturbance assumptions and estimates.)

AIR QUALITY

The ISA Complex would continue to be managed as a PSD Class II area. Disturbance of 12 acres would result in minor temporary increases in fugitive dust emissions; however, over the long term, air quality would remain essentially as at present.

GEOLOGY

No impacts to geology are expected because of the 12 acres of surface disturbance associated with oil and gas exploration. The surface disturbances and widely spaced wells would not change the geologic structure of the area.

SOILS

It is estimated that only 12 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.45 cubic yard/acre/year. Soil loss on the 12 acres would increase from 5.4 cubic yards/year to 34.1 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the ISA Complex would increase by approximately 29 cubic yards (less than 1 percent) over current annual soil loss.

VEGETATION

The anticipated maximum of 12 acres disturbed would not significantly impact the sparse vegetation of the ISA Complex. Two plant species under review for threatened and endangered status could occur in the ISA Complex.

Before authorizing surface-disturbing activities, BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken, it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be protected with the No Action Alternative.

WATER RESOURCES

Dark Canyon contains year-round flowing water from Black Steer for 10 miles in the ISA. No significant sedimentation or change in TDS is expected to occur. Opportunities for maintenance, additional improvements, or expansion of existing water sources could not occur in the Primitive

Area. The 12 acres of disturbance in the Middle Point area, with slightly increased soil erosion, would not be significant enough to create a change in TDS or sedimentation in Dark Canyon.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

The 62,040 acres of the Dark Canyon Primitive Area and 1,250 acres in the Middle Point area are not open to leasing, and it is assumed that no leasing in these areas would continue. In the Middle Point area 4,740 acres could be leased with special stipulations for protecting the Beef Basin deer winter range. Although the 4,740 acres are now open to lease, there has been little recent interest in leasing or exploration.

Assuming that the oil and gas potential would be uniformly distributed throughout the 68,030 acres of the ISA Complex, the 4,740 acres open for leasing would have about 7 percent of the estimated recoverable reserves of 3 million barrels of oil or 18 billion cubic feet of natural gas. About 93 percent of these potential reserves would be foregone due to the continuation of the existing withdrawal. A potential resource of up to 2.7 million barrels of oil or 16 billion cubic feet of natural gas could be foregone. This would allow recovery of .3 million more barrels of oil or 2 billion cubic feet of natural gas than with the All Wilderness Alternative.

There are currently no mining claims in the ISA Complex. The 62,040-acre Primitive Area is withdrawn from mining claim location. This area would continue to be withdrawn from mineral entry and development would be foregone; however, the potential for locatable mineral development in the ISA Complex is very low; therefore, even though 5,990 acres in the Middle Point area would be open to mining claim location, no impacts would result. Mineral values, including coal, uranium, vanadium, copper, manganese, potash, or geothermal resources, are not known to be present in the ISA Complex.

WILDLIFE

The No Action Alternative would protect the 62,040 acres of crucial yearlong desert bighorn sheep habitat due to the ORV and leasing closures and mineral withdrawals.

Two species of threatened and endangered birds (bald eagle and peregrine falcon) may occasionally use the ISA Complex. Before authorizing surface-disturbing activities, BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken to protect these raptors, it can be reasonably concluded that the viability of populations of threatened and endangered species would be preserved under the No Action Alternative.

There are no identified wildlife-related vegetation treatments or facilities planned within this ISA Complex so no impact would result. There are no critical use areas for threatened and endangered species.

FOREST RESOURCES

Since minimal surface-disturbing activities are anticipated, no significant loss of forest resources is expected from the 12 acres affected by oil and gas development. Forest products could be harvested in the Middle Point area where an estimated 848 cords would be available for use. This location is not expected to be substantially used because of the many other fuelwood areas more convenient to population centers.

LIVESTOCK

Domestic livestock grazing would continue as authorized in the Beef Basin MFP and subsequent BLM land use plans. The 844 AUMs currently allocated in the ISA Complex are assigned to two livestock permittees. Additional roads or other facilities for livestock handling could be proposed and developed in the future without regard for wilderness values. Since motorized vehicles are currently used very little to manage livestock in the ISA Complex few, if any, changes in livestock management techniques are expected. No new livestock developments have been proposed within the ISA Complex.

VISUAL RESOURCES

Under this alternative visual resources would be protected on 62,040 acres under VRM Class I. In the Middle Point area, 12 acres of mineral-related exploration and development are possible. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. VRM objectives would probably be met in the Class IV Middle Point area during the short term. Even after rehabilitation, some permanent localized degradation would be expected. If roads, vehicular ways, and drill pads are located throughout the Middle Point

area (worst-case analysis), visual quality could be significantly reduced on 5,990 acres. With only 12 acres of disturbance projected, this impact is unlikely to occur.

CULTURAL RESOURCES

Cultural resources on 62,040 acres would receive extra protection as a result of the leasing closure and locatable mineral withdrawal. Disturbance of 12 acres by oil and gas exploration and development in the Middle Point area could impact cultural resources through loss and vandalism due to increased access. However, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would lessen impacts. Inadvertent loss or damage could occur in the disturbed area. The overall effect on cultural resources is expected to be minimal. Vandalism could be a problem and would increase in proportion to the general population increase. A small but unknown percent of the 32 recorded and 2,658 potential sites would be adversely affected.

RECREATION

Primitive recreation values would be protected on 62,040 acres of the existing Dark Canyon Primitive Area.

Potential adverse impacts to the primitive and unconfined recreation experience in the Middle Point area could occur as a result of nonwilderness designation. Surface-impacting activities on Middle Point would reduce the amount of land available for these types of activities. Motorized activities would be allowed and would be in conflict with nonmotorized uses where their areas of use overlap. In contrast, motorized recreation users would benefit from the Middle Point lands being available for use. The .5 mile of ways and jeep trails would be open to ORV use although they are only occasionally used for ORV travel. On Middle Point the quality of a user's primitive recreational experience could be reduced by surface-disturbing activities. Under this alternative mineral-related exploration and development could directly impact up to 12 acres and primitive recreational opportunities in the Middle Point Area would probably not be lost.

The future trends in recreational use of the ISA Complex are unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use is expected to increase from 4,535 current visitor days per year to 6,739 visitor days at the end of 20 years. Assuming that the 2-percent increase would be uniform among all recreation uses in the ISA Complex, primitive recreational use would increase from the estimated current use of 4,308 visitor days per year to about 6,401 visitor days per year over the next 20 years. Likewise, recreational activities utilizing vehicular access (hunting, sightseeing, ORVs, etc.) would increase from 227 visitor days per year to 338 visitor days per year.

WILDERNESS VALUES

Wilderness values on 68,030 acres would not be added to the NWPS. Without wilderness designation, the ISA Complex would be left without a formal designation because the Primitive Area designation would not be continued. Existing mineral leasing and mining restrictions would limit the surface-disturbing activities from these activities on 62,040 acres. Due to the inaccessibility of portions of the ISA Complex, wilderness values would remain on these acres. Management of the area would be according to the Beef Basin MFP and subsequent BLM planning documents. Approximately 12 acres of surface disturbance could take place from oil and gas exploration and development in the Middle Point area. This surface disturbance could result in loss of naturalness and outstanding opportunities for solitude and primitive, unconfined recreation throughout the Middle Point area if roads, vehicular ways, and drill pads are located throughout the area. However, there is little probability for this to occur because only 12 acres of disturbance is projected and the potential for oil and gas development and related disturbance is low in the ISA Complex.

Naturalness and the outstanding opportunities for solitude and primitive recreation would probably not be lost.

LAND USE PLANS AND CONTROLS

Not designating the ISA Complex as wilderness would not conflict with the *San Juan County Master Plan* because the Plan predates wilderness consideration. However, current mineral closures in the Dark Canyon Primitive Area that would be continued with ONA or ACEC designation are not consistent with San Juan County's multiple-use concept. The BLM Beef Basin MFP (as superseded by the San Juan RMP) would be amended to delete the Primitive Area status and to consider ONA or ACEC designation. It is assumed that BLM land use plans would continue the ORV closure on 62,040 acres and mineral leasing and location closure on 63,290 acres. Restrictions placed on activities with the ONA or ACEC desig-

nation would generally complement management of the contiguous FS wilderness and NPS proposed wilderness areas. However, ACEC or ONA designation might not offer as long-term or complete protection as wilderness designation.

SOCIOECONOMICS

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop resources would remain as at present (closed on 63,290 acres and open on 4,740 acres). Due to an unfavorable geologic environment no leasable or locatable minerals other than oil and gas are considered to be potentially present in the ISA Complex. The probability of economic development of minerals within the ISA Complex is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the existing grazing use (844 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because annual recreational use in the area is estimated to increase up to 2,093 visitor days by the end of 20 years and overall recreation-related expenditures average $4.10 per visitor day (only a portion of which contributes to the local economy), an annual increase of up to $8,581 recreation-related expenditures attributable to the ISA Complex could occur; however, this would likely not be significant to the local economy. Total income related to the projected 6,739 visitor days would be $27,629.

Federal and State revenues would not be reduced by this alternative. There are 4,740 acres in the ISA Complex open to oil and gas leases that are currently not leased. If leased they would bring up to $14,220 additional Federal lease fee revenues per year in addition to any royalties from lease production. Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees ($1,182 per year) would continue. About 50 percent of the livestock revenues would be returned to the local BLM office for use in range improvement projects.

All Wilderness Alternative (68,030 Acres) (Proposed Action)

As identified in the Description of the Alternatives section, the major changes that could occur in the 68,030-acre area would be related to its withdrawal from mineral location and closure to new mineral leasing and sale in the Middle Point area. The entire area would be placed in leasing Category 4 (closed to leasing). About 7.5 miles of existing vehicular ways in the ISA Complex would be closed to vehicular use except for approvals by BLM as discussed in the Description of the Alternatives section. The ISA Complex would be managed under VRM Class I.

No oil and gas leases exist within the ISA Complex and future leasing of oil and gas would not be allowed. (Appendix 10 lists surface disturbance assumptions and estimates for the ISA Complex.)

Because potentially disturbed areas for this alternative would be smaller than under the No Action Alternative (0 vs. 12 acres), the impacts from development and surface disturbance on air quality, geology, soils, vegetation, water, forest, and cultural resources under the All Wilderness Alternative would be insignificant as described for the No Action Alternative. Wilderness designation would provide additional protection to these resources. Other effects on these resources due to changes in management are discussed below.

WATER RESOURCES

Opportunities for additional improvements or expansion of existing water improvements could not occur.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Approximately 4,740 acres are available for oil and gas leasing but none are currently under lease. Future leasing would not take place if the ISA Complex were designated wilderness.

Exploration for and development of a potential resource of up to 3 million barrels of oil or 18 billion cubic feet of natural gas potentially recoverable could be foregone under this alternative. Only .3 million barrels of oil and 2 billion cubic feet of natural gas would be lost in comparison to the No Action Alternative. However, due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities, it is concluded that this alternative would not result in a significant loss of potential oil and gas recovery.

Locatable Minerals

No locatable minerals are known to exist in the ISA Complex. No mining claims currently exist. It is assumed that the ISA Complex would remain free from mining claims prior to wilderness

designation due to lack of locatable mineral potential. With wilderness designation, no known minerals would be foregone.

WILDLIFE

Under this alternative, some wildlife could benefit due to the preservation of solitude. Wilderness designation would protect the 62,040 acres of crucial yearlong desert bighorn sheep habitat. There are no identified wildlife-related vegetation treatments or facilities planned within this ISA Complex; therefore, no impact would result. There are no critical use areas for threatened and endangered species. The occasional presence of peregrine falcon and bald eagle could continue to occur in the ISA Complex.

LIVESTOCK

Present domestic livestock grazing would continue as authorized in the BLM land use plans. The 844 AUMs currently allocated in the ISA Complex would continue to support livestock grazing. The existing range projects (a developed spring and 80-acre seeding) would be maintained based on reasonable use and need. Since very little use of motorized vehicles is currently taking place to manage livestock, little effect on the management of livestock grazing is expected.

New rangeland improvements (none are now proposed) would be allowed if determined necessary for the purposes of rangeland and/or wilderness protection and the effective management of these resources. However, future roads or other livestock management facilities could be restricted to preserve wilderness values. There are no proposed land treatments that could be foregone with designation.

VISUAL RESOURCES

A slight benefit would occur to the protection of exceptional visual resources of the ISA Complex because the VRM class would change from Class IV to a more restrictive Class I on 5,990 acres in the Middle Point area. Class I generally allows only natural ecological changes and, therefore, would reduce the potential for surface-disturbing activities. Since no surface-disturbing activities are predicted for the ISA Complex with this alternative, Class I objectives likely would be met and the outstanding visual resources would remain. Existing intrusions, including 7.5 miles of existing ways, would gradually return to an unnoticeable condition.

CULTURAL RESOURCES

There is a potential for increased vandalism to cultural resources due to increased recreational use of the ISA Complex. However, protection afforded by wilderness management would outweigh any potential vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

With the All Wilderness Alternative the entire 68,030 acres would be closed to recreational ORV use, including the approximately 7.5 miles of ways. Motorcycle riding and ORV use are two popular activities in the area surrounding the ISA Complex, and recreationists have been known to ride in the Middle Point portion of the ISA Complex. Approximately 100 visitor days of ORV use would not occur inside the ISA Complex. This would probably not be significant because of the availability of areas open to ORV use in the vicinity of the ISA Complex.

Primitive recreation values would be enhanced through wilderness management goals to protect the opportunities present. By increasing public awareness of the area, designation could result in increased recreation use of the ISA Complex. Judging from use densities of a number of well known wilderness areas and primitive areas in the region, the ISA Complex's site characteristics, the population distribution about the ISA Complex, and the availability of similar sites, it is estimated that, following designation, use could be as much as 17,008 visitor days per year (USDI, BLM, 1985). This would be 12,473 visitor days over the area's current estimated 4,535 annual visitor days.

Management provided through a wilderness management plan would regulate increases in future recreation use and the quality of the primitive recreational experience would probably not be negatively affected by increased use.

WILDERNESS VALUES

Designation and management of all 68,030 acres as wilderness would contribute to the preservation of the wilderness values of size, naturalness, and outstanding opportunities for solitude and primitive, unconfined recreation. The special scenic, wildlife, and cultural resource features in the ISA Complex also would be protected and preserved. Wilderness values such as naturalness would benefit from the avoidance of surface-disturbing activities. Also, hiking, backpacking, rock scrambling, and other primitive types of recreational activities would probably be more notable with wilderness designation. Recreational use would be expected to increase with growing public awareness of the area.

LAND USE PLANS AND CONTROLS

The Dark Canyon Primitive Area was designated a Primitive Area in 1970 as a result of the multiple-use classification inventory process completed in 1968. The Beef Basin MFP recognized the Primitive Area and made no further recommendations. The forthcoming San Juan RMP will acknowledge the wilderness study but will not cover wilderness designation. Wilderness designation would be an amendment to the MFP and the subsequent San Juan RMP scheduled for completion in 1986.

The *San Juan County Master Plan* zones this area as open range and forest lands. The All Wilderness Alternative emphasizes multiple use on public lands and would not totally conflict with the County's multiple-use concept since most resource uses would continue, although under more restrictive conditions. However, this alternative would partially conflict with the county's multiple-use concept because restrictive conditions would be placed on mineral development on 68,030 acres including 5,990 acres that are currently open to mineral development. Wilderness designation would not conflict with the policy of the State of Utah to maximize economic returns since there are no State lands in the ISA Complex.

This alternative would be consistent with and enhance the land use plans of the adjacent Manti-LaSal National Forest, Canyonlands National Park, and Glen Canyon NRA. All three of these plans indicate designated or proposed (administratively endorsed) wilderness management contiguous to the BLM Dark Canyon ISA Complex.

SOCIOECONOMICS

There would not be a loss of existing local employment or income as a result of this alternative. The entire 68,030 acres would be closed to mineral exploration and development, including the 4,740 acres now open to leasing and 5,990 acres now open to mining claim location. This would not have any socioeconomic impacts as the potential for mineral and energy resources in the ISA Complex is considered to be low.

There would be no livestock-related economic losses because the existing grazing use (844 AUMs) and ability to maintain and replace range improvements would remain.

As a result of wilderness designation, recreational use is expected to increase to 17,008 visitor days per year during the next 20 years. With overall recreation-related expenditures averaging $4.10 per visitor day (Dalton, 1982), total annual local income is projected to be $69,732 attributed to recreation use with wilderness designation. This could be significant to local businesses specializing in recreation equipment and services. Also, an unknown increase in recreation use by commercial outfitters and guide services could result in significant increased income to these currently nonlocal businesses.

Federal and State revenues would not be reduced by this alternative, as there are no oil and gas leases that would expire. Loss of potential to lease 4,740 acres for oil and gas at $3 per acre would result in a potential loss of $14,220 in Federal revenues per year over the long term as compared to the No Action Alternative. Collection of livestock grazing fees ($1,182 per year) would continue. About 50 percent of these revenues would be returned to the local BLM office for use in range improvement projects. Federal revenues from commercial recreation permits would increase an undetermined amount.

Partial Wilderness Alternative (62,040 Acres)

The wilderness values on 62,040 acres within the Dark Canyon ISA Complex would be added to the NWPS. The wilderness values on 5,990 acres in the Middle Point area would not be added to the NWPS. Potential mineral disturbance is not predicted to occur due to the lack of locatable minerals present. The major activities that would occur in the designated portion of the ISA Complex for this alternative are the same as described for the All Wilderness Alternative. For the nondesignated portion, management would be as described for the No Action Alternative including 12 acres of disturbance for oil and gas exploration and development. The specific actions that would take place within the 62,040-acre area designated as wilderness and the 5,990-acre nondesignated area are discussed in the Description of the Alternatives section.

The impacts related to the Partial Wilderness Alternative would be the same as the No Action Alternative for the following resources: air quality, geology, soils, vegetation, water, mineral and energy, forest, livestock, wildlife, visual, and cultural resources. This would be due to the existing Primitive Area status and the restrictions on development assumed to continue with the No Action Alternative. These restrictions in most respects would result in essentially the same effects on the resources as from wilderness designation. Small differences are projected for recreation, land use plans, and socioeconomics. The following analysis describes these differen-

ces between the Partial Wilderness, No Action, and All Wilderness Alternatives.

RECREATION

Motorized recreation would not be allowed on the 62,040 acres in the designated wilderness. About 7.0 miles of ways would be closed; however, other locations are available for this recreation use. The primitive recreation activities would be maintained. Although the 62,040-acre Dark Canyon Primitive Area is already relatively well known, additional publicity resulting from wilderness designation is projected to increase the visitor use. Annual visitation is estimated to increase to as much as 15,510 visitor days after designation. This would be about 10,975 visitor days more than the No Action Alternative and 1,498 visitor days less than the All Wilderness Alternative. Recreation in the Middle Point area could occur on 5,990 acres including .5 mile of ways as described for the No Action Alternative.

LAND USE PLANS AND CONTROLS

Although some existing uses would continue in the designated wilderness, designation of 62,040 acres in the Dark Canyon ISA Complex would not be consistent with San Juan County's concept of multiple-use because of restrictions on mineral development. Nondesignation for the 5,990-acre Middle Point area would be consistent with the County's multiple use concept. The *San Juan County Master Plan* does not specifically address wilderness in the Dark Canyon area. Although the current BLM Primitive Area designation and the No Action Alternative contain many of the same limitations as would be applied on the 62,040-acre wilderness area, the formal designation by Congress may be viewed as more restrictive and inconsistent with the County's multiple-use concept than somewhat similar management under BLM land use plans.

SOCIOECONOMICS

Overall there would be no significant changes in current trends of population, employment, and local income distribution.

Income and revenues would be the same as for the No Action Alternative, except for a projected increase in local income related to recreation use. As a result of increased visitation resulting from wilderness designation, total annual local recreation income is estimated to reach $63,591 at the end of 20 years, as compared to $27,629 with the No Action Alternative and $69,732 with the All Wilderness Alternative. Both the Partial Wilderness Alternative and the All Wilderness Alternative could result in significant income to local businesses serving wilderness users.

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Butler Wash WSA

BUTLER WASH WSA
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BUTLER WASH WSA
(UT-060-169)

INTRODUCTION

General Description of the Area

The Butler Wash Wilderness Study Area (WSA) contains approximately 24,190 acres of BLM-administered land; lying within the boundary but not included in the WSA are three State sections totaling 2,560 acres. Acreage differences between the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980) and those reported in this Environmental Impact Statement (EIS) are due to a slight boundary modification.

The WSA is located in northwestern San Juan County, about 55 road miles northwest of Monticello. It is bounded by The Needles proposed wilderness of Canyonlands National Park on the east and north; a jeep trail into the Grabens and the road across Bobby's Hole on the northwest; section lines and State lands on the west; the Ruin Park road, the east edge of Beef Basin, and the House Park road on the southwest; a road circling a butte south of the West Fork of Salt Creek, State lands, and section lines on the south.

The configuration of the unit forms a rough triangle in shape. It is 16 miles long (north to south) and 8 miles wide (east to west) at its longest and widest points.

Butler Wash and its tributaries drain this unit to the north into the Needles District of Canyonlands National Park and eventually the Colorado River. The WSA also contains parts of the upper ends of West Fork and main fork of Salt Creek drainages. The canyons are relatively shallow with meandering sand and gravel wash bottoms. The upper ends of Salt Creek show the deepest cutting with abrupt 600-foot canyons. Colorful red sandstone alternates with bands of white sandstone on the walls of these canyons.

This WSA is a mosaic of pinyon-juniper-covered mesas and slopes, sagebrush parks, and buff-colored sandstone and buttes, knobs, and pinnacles. These eroded sandstone outcrops are particularly striking in the northern and eastern portions of the unit. The Needles District of Canyonlands National Park, bordering this unit on the north and east, was named for the many sandstone spires in this area.

Information on the climate of Butler Wash is limited because the nearest weather station is at Canyonlands National Park, 6 air miles away from Butler Wash. In addition, Canyonland's elevation of 5,000 feet is not representative of Butler Wash's elevation, which ranges from 5,600 to 7,400 feet.

The average annual temperature at Canyonlands is 53 degrees Farenheit (F), with an average low of 38 degrees F, and an average high of 69 degrees F. The record low is -11 degrees F, and the record high is 105 degrees F.

Annual precipitation ranges from 8 to 12 inches over Butler Wash. January, March, and August are the driest months. June, September, and October are the wettest months. Annual total snowfall ranges from 20 to 30 inches.

Specific Issues Identified in Scoping

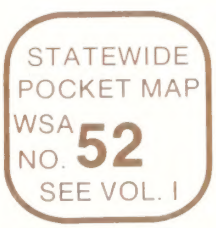
General issues pertaining to the WSAs in the San Juan Resource Area are discussed in Volume I.

Several concerns pertaining to the wilderness study process and/or the environmental analysis process were raised during scoping. These concerns are discussed in the Scoping section of Volume I rather than in individual analyses for WSAs.

Specific issues pertaining to the Butler Wash WSA identified through formal public scoping (USDI, BLM, 1984) are responded to below.

1. *Comment:* This WSA has previous disturbance from oil and gas activity and mining. Existing oil and gas leases and mining claims make this area less desirable.

   Response: No disturbance from oil and gas activity has occurred within the WSA. There are several disturbances just outside the southern boundary of the WSA. There are no mining claims within the WSA and no known mining activity has occurred. The effect of wilderness designation on leases and the effect of leases on wilderness values are addressed under the Wilderness Values and Mineral and Energy Resources sections of this document. Wilderness designation would not affect the termination of existing leases but would preclude future leasing in the WSA.



2. *Comment:* If the WSA were outstanding, it would have been included in Canyonlands National Park.

Response: The WSA contains wilderness values. Determining whether or not it has National Park values as well is not within the scope of the wilderness review.

3. *Comment:* What would the effect of wilderness designation be on private and State in-holdings in Butler Wash?

Response: There are no private in-holdings within the WSA. Should the area be designated wilderness, State sections within the WSA could be exchanged. See the Land Use Plans and Controls sections of this document.

4. *Comment:* The oil and gas potential of the WSA is ranked low by Science Applications, Inc. (SAI, 1982). Based on proprietary information, representatives of the oil and gas industry believe the potential of the WSA to be high. This information should be considered in the Draft EIS.

Response: At this time BLM has not made an independent assessment of geologic information gathered by oil and gas companies. The SAI (1982) report will be used as the reference on oil and gas potential for this EIS, but information provided by the oil and gas industry and available mineral investigation reports by the USDI, Geological Survey and Bureau of Mines will be reviewed by BLM prior to making final wilderness recommendations to the Secretary of the Interior.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated from Detailed Study

No alternatives were identified for this WSA during scoping other than those analyzed.

Alternatives Analyzed

Two alternatives are analyzed for this WSA: (1) No Action; and (2) All Wilderness (24,190 acres). The All Wilderness Alternative includes a boundary modification that would increase the area to 24,190 acres from its original 22,030 acres. Because there is essentially no difference in environmental consequences between the alternative and the variation, only the larger (24,190-acre) figure is used for analysis in this document.

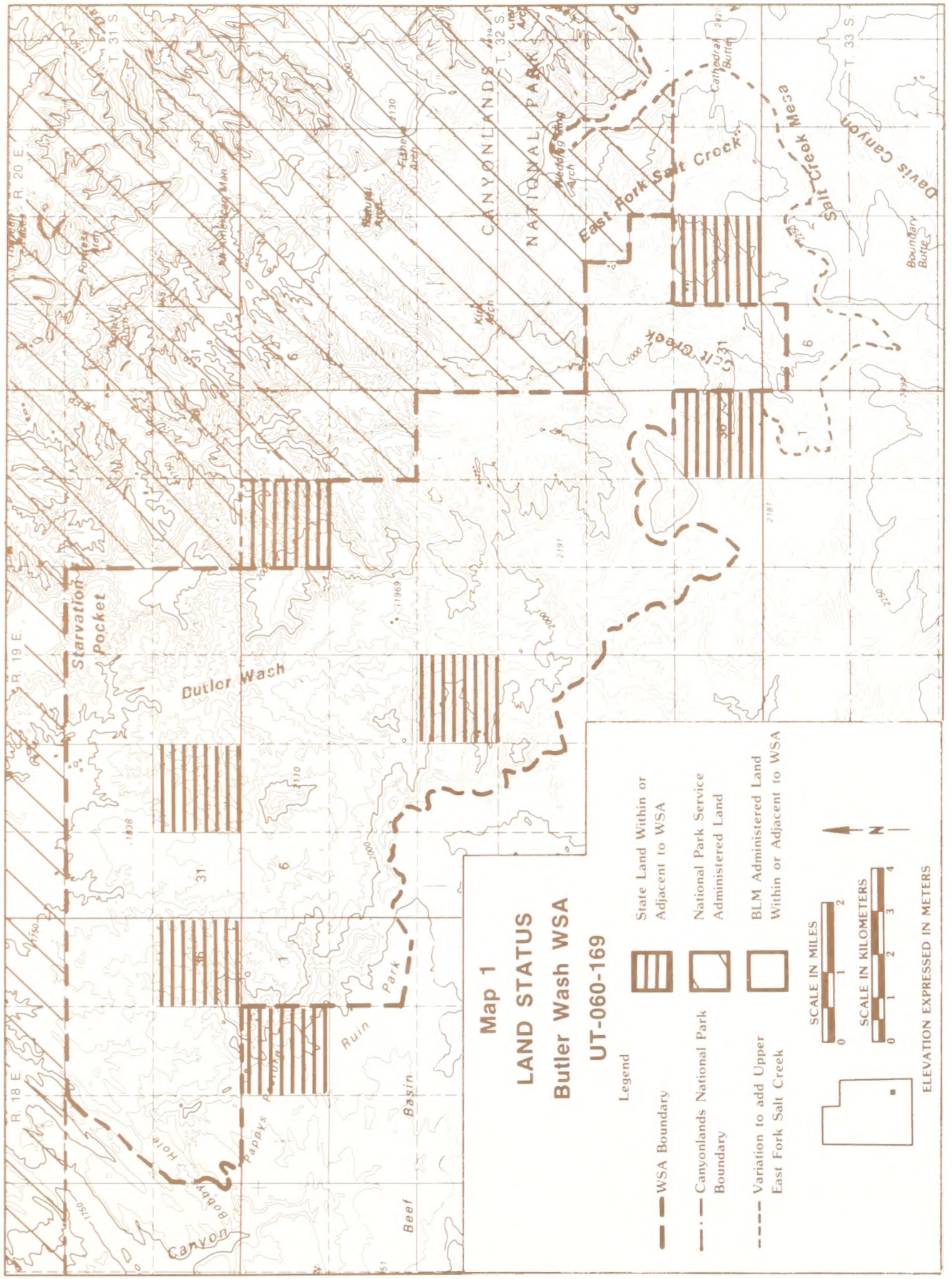
A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 24,190-acre Butler Wash WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the Beef Basin Planning Unit Management Framework Plan (MFP) (USDI, BLM, 1973) until that plan is superseded by the San Juan Resource Management Plan (RMP) currently scheduled for completion in 1986. The three sections of State land within the WSA (refer to Map 1) have not been identified in the MFP for special Federal acquisition through exchange or purchase. No private lands are located within the WSA.

The following are specific actions that would take place under this alternative:

- All 24,190 acres would remain open to mineral location and sale. There are no existing mining claims; however, development work, extraction, and patenting would be allowed on any future valid mining claims. Development would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases (nine leases on 8,580 acres) and future leases could be developed under leasing Category 1 (standard stipulations) on about 3,890 acres, Category 2 (standard and special stipulations) on about 2,620 acres, Category 3 (no surface occupancy) on 8,320 acres, and Category 4 (no leasing) on 9,360 acres.
- The present domestic livestock grazing use of about 206 Animal Unit Months (AUMs) in the WSA would continue as authorized in the MFP or other applicable BLM planning document. Use of the existing range developments (one reservoir) would continue. New rangeland improvements could be implemented without wilderness considerations, although none are now proposed.


Map 1
LAND STATUS
Butler Wash WSA
UT-060-169
Legend
WSA Boundary
Canyonlands National Park Boundary
Variation to add Upper East Fork Salt Creek
State Land Within or Adjacent to WSA
National Park Service Administered Land
BLM Administered Land Within or Adjacent to WSA
SCALE IN MILES
SCALE IN KILOMETERS
N
ELEVATION EXPRESSED IN METERS
Butler Wash
Starvation Pocket
Beef Basin
Ruin Park
Bobby Hole Canyon
Pappys
East Fork Salt Creek
Salt Creek Mesa
Davis Canyon
Boundary Butte
Cathedral Butte
CANYONLANDS NATIONAL PARK
R. 18 E.
R. 19 E.
R. 20 E.
T. 31 S.
T. 32 S.
T. 33 S.

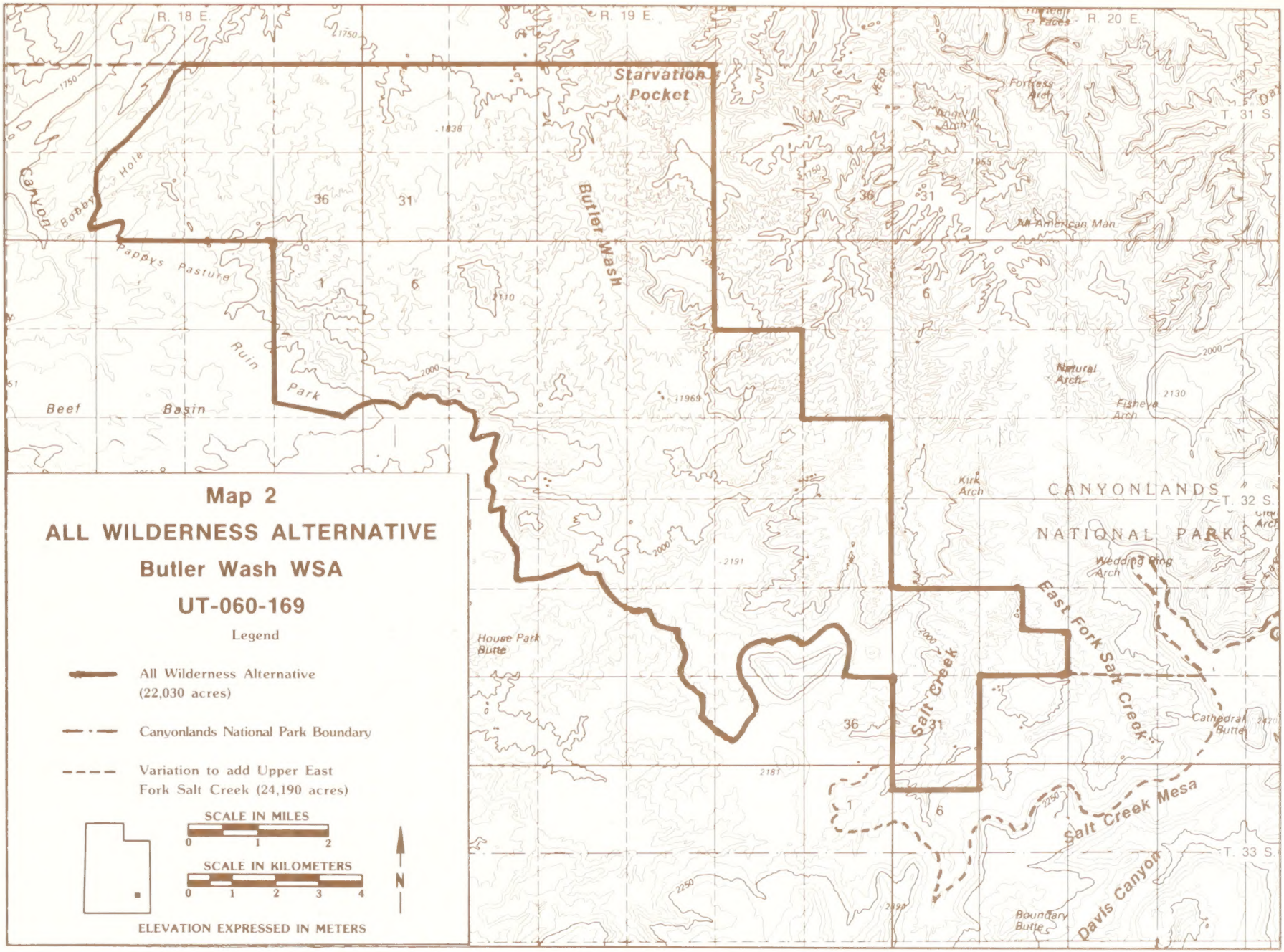
- Use, maintenance, and development of facilities and improvements for wildlife, water resources, etc., could be allowed if in conformance with the MFP. None exist or are currently planned for the area.
- The entire WSA acreage, including about 2 miles of existing vehicular ways would be open to off-road vehicle (ORV) use and new access routes for development would be allowed. The rough terrain limits ORV activities.
- The entire area would be open to woodland product harvest. There is no appreciable harvest of forest products at the present time, nor is any planned.
- The area would continue to be managed as Visual Resource Management (VRM) Class II (11,630 acres) and Class IV (12,560 acres).
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under the All Wilderness Alternative, all 24,190 acres of the Butler Wash WSA would be designated by an act of Congress as part of the National Wilderness Preservation System (NWPS) (refer to Map 2). This would include the 22,030 acres of the original All Wilderness Alternative, plus an additional 2,160 acres in the Upper East Fork Salt Creek drainage. The 24,190 acres would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. On designation, Federal acquisition of three sections of State land (1,920 acres) within the original WSA and one State section (640 acres) within the boundary addition area are likely and would be authorized by purchase or exchange. Two State sections adjacent to the WSA would probably not be exchanged. However, one adjacent State section (Section 2, Township 32 South, Range 19 East) could become isolated by wilderness proposals of BLM and NPS, depending on final boundaries. If this were the case, this section would also likely be acquired upon wilderness designation of the adjacent Federal lands. It is assumed that wilderness management and resulting impacts on acquired State lands would be the same as those on adjacent Federal lands. Acreage figures and quantities (e.g., AUMs, number of leases, etc.) in this analysis are for Federal lands only. No private or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 24,190 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on any valid mining claims located prior to wilderness designation. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809), with consideration given to wilderness values. Existing oil and gas leases, involving 8,580 acres of the WSA, would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.
- Present domestic livestock grazing would continue as authorized in the Beef Basin MFP until that plan is superseded by the San Juan RMP scheduled for completion in 1986. The 206 AUMs in the WSA would remain available to livestock as presently allotted. The use and maintenance of rangeland developments existing at the time of designation (one reservoir) could continue in the same manner as in the past based on practical necessity and reasonableness. After designation, new rangeland developments would be allowed on a case-by-case basis if necessary for rangeland and/or wilderness resource protection and management, as long as special criteria to protect wilderness values are met (refer to Appendix 1). No rangeland developments are currently proposed.


R. 18 E.
R. 19 E.
R. 20 E.
T. 31 S.
T. 32 S.
T. 33 S.
Starvation Pocket
Butler Wash
Bobby Hole Canyon
Pappys Pasture
Ruin Park
Beef Basin
Fortress Arch
Angel Arch
All American Man
Natural Arch
Fisheye Arch
Kirk Arch
CANYONLANDS NATIONAL PARK
Wedding Ring Arch
East Fork Salt Creek
Salt Creek
House Park Butte
Cathedral Butte
Salt Creek Mesa
Davis Canyon
Boundary Butte
Map 2
ALL WILDERNESS ALTERNATIVE
Butler Wash WSA
UT-060-169
Legend
All Wilderness Alternative (22,030 acres)
Canyonlands National Park Boundary
Variation to add Upper East Fork Salt Creek (24,190 acres)
SCALE IN MILES
0 1 2
SCALE IN KILOMETERS
0 1 2 3 4
N
ELEVATION EXPRESSED IN METERS

- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are located in the Butler Wash WSA, and none are currently planned.
- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values, as long as criteria to protect wilderness values are met. No wildlife transplants or developments are existing or planned in this WSA.
- The entire 24,190-acre area would be closed to ORV use except for: (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. About 2 miles of existing ways in the WSA would not be available for vehicular use except as indicated above. About 7 miles of dirt roads that form part of the boundary of the WSA would remain open to vehicular use.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 24,190-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pinyon nuts or noncommercial gathering of dead-and-down wood if accomplished by other than mechanical means. There is minimal harvest of forest products at the present time, and none is specifically planned.
- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Because of this, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Hunting would be allowed subject to applicable State and Federal laws and regulations but without the use of motorized vehicles.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
BUTLER WASH WSA

Resource	Alternatives	
	No Action	All Wilderness (24,190 Acres) (Proposed Action)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil, 18 billion cubic feet of natural gas, 750,000 tons of potash, 500 tons of uranium oxide, and 50,000 tons of copper.	Oil, gas, and potash likely would not be recovered. Assuming a worst-case analysis, copper and uranium recovery would also be foregone. Due to the low likelihood of recovery of these mineral resources, however, the loss of development opportunity would not be significant.
Wildlife	About 2.5 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.
Livestock	Grazing of 206 AUMs and maintenance of one existing livestock reservoir would continue. New developments could be constructed; however, none are now proposed.	Grazing of 206 AUMs and maintenance of the existing reservoir would continue. Little effect on grazing management is expected. New developments proposed in the future might not be allowed.
Visual Resources	The quality of visual resources could be impaired on up to 600 acres.	Visual quality could be impaired on up to 20 acres.
Recreation	ORV use would continue on 2 miles of ways at current low levels. Overall recreational use could increase from the present 444 visitor days per year to 662 over the next 20 years. Up to 600 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including 2 miles of ways, would be closed to ORV use. Recreational use could increase to up to 4,838 visitor days per year due to publicity associated with wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 600 acres (2.5 percent of the WSA).	Wilderness values would be protected, except on up to 20 acres (less than 0.1 percent of the WSA) which may be disturbed by development of valid mineral rights.
Land Use Plans and Controls	This alternative would be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the current BLM Beef Basin MFP. It would not complement the NPS proposal for nearby wilderness.	This alternative would not be consistent with San Juan County's concept of multiple use. It would be consistent with State policy if lands were exchanged, and would complement the NPS proposal for wilderness. Designation would constitute an amendment of the BLM Beef Basin MFP or the San Juan RMP.
Socio-economics	Annual local sales of less than $5,940 and Federal revenues of up to $26,128 would continue. An additional $18,750 per year in Federal revenue could be derived from leasing of presently unleased areas.	Annual local sales of less than $5,940 and Federal revenues of up to $288 would continue, but Federal revenues of up to $44,490 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA, but increased recreational use might result in local sales of up to $19,836.

AFFECTED ENVIRONMENT

Air Quality

The Utah Division of Health has a network of air monitoring stations throughout the State. The closest monitoring station to Butler Wash is 70 miles south at Bullfrog Marina. Only particulate and sulfur dioxide concentrations are measured at Bullfrog.

Only the short-term (24-hour) particulate standard has been exceeded at the Bullfrog station. The 24-hour violations were probably associated with conditions of high winds and blowing dust (resulting from the scarce vegetation and large areas of exposed sand). While only 1976 data are available, sulfur dioxide concentrations measured at Bullfrog Marina are low and well under the applicable ambient standards.

Generally the air quality is very good over the WSA, allowing for long vistas where topography and vegetation allow. Visual range in the general vicinity averages between 100 to 132 miles during the summer (Aerocomp, Inc., 1984). Generally, the average visibility is greater in the winter than in the summer. The WSA has a Prevention of Significant Deterioration (PSD) Class II air quality classification as per the 1977 Clean Air Act Amendments. This allows for moderate increases in air pollution levels. Canyonlands National Park, which forms the north and east boundaries of the WSA, is the nearest PSD Class I area.

Geology

Butler Wash WSA is within the Canyonlands Section of the Colorado Plateau Physiographic Province. This section is characterized by bare rock surfaces, plateaus, and steep-walled canyons.

This WSA consists of 24,190 acres of canyons, open parks, high buttes, and intricate pinnacles. Topographic variation is limited in the western half of the area. The eastern half contains considerably more relief with canyons, buttes, and pinnacles being the dominant landforms. Elevation within the WSA ranges from 5,600 to 7,400 feet above sea level.

Topographic screening in the eastern half of the area is excellent, while in the western half it is limited.

The surface geology of the Butler Wash WSA consists almost entirely of flat-lying sedimentary rocks of the Cedar Mesa Sandstone Member of the Permian Cutler Formation. Deep canyons have cut into the area exposing the underlying Pennsylvanian Rico Formation.

The Cedar Mesa Sandstone Member is generally white, fine-grained, calcareous, and cross-bedded. It is a near-shore shallow-water marine deposit that was transported into the area by a long-shore current from the northwest. The Cedar Mesa Sandstone interfingers eastward with the Cutler Formation.

The Rico Formation underlying most of the area is a transitional unit composed of alternating marine and continental sediments 300 to 400 feet thick. It is a red and gray, thick- and thin-bedded unit of calcareous sandstone, sandy shale, resistant gray limestone, and sporadic purple arkose. The Rico Formation in this vicinity may represent the upper half of the Elephant Canyon Formation up to the base of the Cedar Mesa Sandstone.

The Butler Wash WSA lies slightly west of the axis of the Monument Upwarp, a broad-trending structural division of the Colorado Plateau which extends 75 miles south to the Arizona border and plunges gently northward in Butler Wash. The upwarp is asymmetrical. The western margin is structurally indistinct; the regional dip is gently inclined to the west and northwest.

Soils

The soils in this WSA have been mapped and described in the *Canyonlands Soil Survey* (U.S. Department of Agriculture, Soil Conservation Service, 1978). The majority of this WSA consists of rock outcrop with some shallow loamy soils (refer to Table 2). There are some areas of moderately deep to very deep loamy and sandy soils along washes, concave slope positions, and on the leeward side of obstructions where eolian material has accumulated.

Under present conditions, average soil loss from erosion is estimated to be about 0.26 cubic yard/acre/year. Total annual soil loss for the entire WSA is approximately 6,290 cubic yards (refer to Table 3).

Vegetation

The vegetation of the WSA is classified as either pinyon-juniper, sagebrush, grassland, or desert shrub. Additional land is classified as barren without substantial vegetation (refer to Table 4 for percentages).

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Bare Soil Surface
Rock Outcrop	65	15,723	0	0
Shallow loamy soils on sloping structured benches and ledges	25	6,048	1	5
Deep and very deep loamy and sandy soils on structural benches and along drainages gently sloping	10	2,419	0.1	1
Totals	100	24,190		

Source: Hansen, 1985.

TABLE 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/acre/year)	Annual Soil Loss Under Present Conditions: Percent of Area	Acres	Cubic Yards	Annual Soil Loss if Disturbed: Percent of Area	Acres	Cubic Yards
Very High	20	—	—	—	—	—	—
High	10	—	—	—	—	—	—
Medium	5	—	—	—	25	6,048	30,240
Low	1	25	6,048	6,048	10	2,419	2,419
Very Low	0.1	10	2,419	242	—	—	—
None	0	65	15,723	0	65	15,723	0
Totals	—	100	24,190	6,290[1]	100	24,190	32,659[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.26 under present conditions; 1.35 if disturbed.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Pinyon-juniper	17,030	70.4
Sagebrush	550	2.3
Grassland	80	.3
Desert Shrub	190	1.0
Barren	6,340	26.0
Totals	24,190	100.0

Source: USDI, BLM, 1968.

The pinyon-juniper type is basically a mature stand of trees with a fair understory species density. Understory species include sagebrush, fourwing saltbush, bottlebrush squirrel tail, and Sandberg bluegrass. Trees are up to 20 feet tall and 12 feet apart on the deeper soils near the southern end of the unit and 12 to 15 feet in height and 30 to 50 feet apart on the shallower soils.

Within the pinyon-juniper type are approximately 15 miles (less than 100 acres) of riparian zone in Butler and the West Fork of Salt Creek Washes. Vegetation in these areas includes cottonwoods, tamarisk, rabbitbrush, sagebrush, and skunkbrush.

The barren areas are primarily exposed rock with some vegetation where soil is present. Vegetation includes blackbrush, serviceberry, and skunkbrush.

The sagebrush parks are generally on the deeper soil sites. Associated species include fourwing saltbush, blue grama, needle and thread grass, Indian ricegrass, and winterfat. Sagebrush plants are approximately 2 feet in height, with a spacing of 3 to 5 feet.

The desert shrub type is primarily blackbrush, with an understory of blue grama, winterfat, fourwing saltbush, and buckwheat. Blackbrush plants are up to 18 inches in height and spaced 5 or more feet apart.

The grassland areas are found on deep sandy soils between rock outcrops. Species include needle and thread grass, Indian ricegrass, blue grama, winterfat, fourwing saltbush, and globemallow.

There are no known threatened or endangered plant species in the unit. One species, *Astragalus monumentalis*, that may occur in the WSA is a BLM sensitive species currently under review by the Fish and Wildlife Service (FWS) for possible threatened or endangered listing.

The Butler Wash WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The map identifies the potential natural vegetation (PNV) type of the WSA as juniper-pinyon woodland. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

Water Resources

Water is a limited resource in this WSA because there are no springs, water wells, or perennial streams. There is one constructed reservoir. Runoff is also retained in slickrock pools along the major drainages for short periods after rainfalls. Hydraulic interconnection is not widespread in the area, and underground water is possibly found in isolated pockets at two levels. Water in the upper level is of low salinity and suitable for use by livestock and wildlife. Discharges are by evaporation, springs, and subriver level seeps into the Colorado River and associated drainages. Water in the lower level is high in salt, with total dissolved solids (TDS) ranging from 80,000 to over 300,000 milligrams per liter (USDI, BLM, 1982a).

Mineral and Energy Resources

The BLM, in coordination with the U.S. Department of Energy, had each WSA assessed for its energy and mineral resource values by SAI (1982). Refer to Appendix 5 for a description of the SAI rating system.

An overall importance rating (OIR) of 2 was assigned to the Butler Wash WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA. The OIR applies to 75 to 100 percent of the unit evaluated by SAI.

Refer to Table 5 for the WSA's mineral and energy resource rating summary.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. The WSA could contain deposits of vanadium and copper that are currently listed as strategic and critical materials (Federal Emergency Management Agency, 1983). Although listed as strategic, copper is relatively common. Supplies currently exceed domestic demand.

TABLE 5

Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f2	c1	Less than 10 million barrels of oil; Less than 60 billion cubic feet of gas
Copper	f2	c1	Less than 50,000 tons
Uranium/Vanadium	f2	c4	Less than 500 tons of uranium oxide
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydroelectric	f1	c4	None
Manganese	f1	c1	None
Potash	f2	c2	Less than 1 million tons

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).

[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

LEASABLE MINERALS

Due to unfavorable geologic conditions, it has been determined that no coal, geothermal, or other leasable resource values are present in this WSA. No leases are located in this WSA for these resources.

Oil and Gas

As of October 1981, a few exploratory wells had been drilled along the Beef Basin anticline near the southwest side of the unit, but all wells were dry. All the wells drilled in this general area are now abandoned, but oil staining has been reported in Mississippian and Pennsylvanian rocks. In addition, wells in the southern part of the Monument Upwarp reportedly have had oil and gas shows in Devonian, Mississippian, Pennsylvanian, and Permian rocks.

Although favorable beds of the Paradox Formation crop out or underlie the WSA, their potential for containing oil is low. Broad uplifts beginning

in late Cretaceous time have caused the overlying Mesozoic sedimentary rocks to be eroded away. It is, therefore, very unlikely that reservoir pressure exists in Pennsylvanian rocks in this area. If oil and/or gas existed in the Paradox Formation in Butler Wash, there is a good chance that it has drained away.

If oil and gas accumulations exist in the immediate area of the WSA, they are likely to be associated with stratigraphic traps and small-scale folding.

In summary, the oil and gas favorability of the WSA is considered low because of deep erosion that probably resulted in the loss of hydrocarbons and the loss of reservoir pressure. The low rating indicates a potential for accumulations of less than 10 million barrels of oil and less than 60 billion cubic feet of gas, with less than 3 million barrels of oil and less than 18 billion cubic feet of gas considered recoverable.

Oil and gas leasing categories were established for the WSA in 1975. These are as follows: Category 1 (standard stipulations), 3,890 acres; Category 2 (standard and special stipulations), 2,620 acres; Category 3 (no surface occupancy), 8,320 acres; and Category 4 (closed to leasing), 9,360 acres. The special stipulations protect deer winter range and prohibit activity from December 1 through March 31. The WSA contains one pre-FLPMA lease covering 560 acres and eight post-FLPMA leases covering 8,020 acres.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

Potash

The only known potash-bearing unit in the Moab District is the Paradox Formation of Pennsylvanian Age. This formation originated in a slowly subsiding, northwest-trending basin called the Paradox Basin that existed in the Moab region about 300 million years ago. The potash deposits in the Paradox Formation are thickest and nearest to the surface along a series of northwest-trending anticlines within a structural zone approximately 100 miles long and 30 miles wide in Utah and Colorado (the Paradox fold and fault belt).

The WSA has been assigned a low favorability rating for potash. If deposits occur, they will generally contain less than 1 million tons of potash, with a recoverable resource of less that 750 thousand tons. No leases for potash occur in the WSA. It is not felt that potash development is likely in the WSA, as other proven reserves are present elsewhere in the region. However, potash could underlie all 22,030 acres of the WSA.

LOCATABLE MINERALS

There are no mining claims within the WSA, and no known mining activity has occurred in this location.

Uranium and Associated Minerals

The WSA has geologic conditions favorable for the occurrence of small deposits of uranium. The unit is assigned a low uranium and vanadium favorability rating (potential resources less than 500 tons of uranium oxide). Because numerous uranium deposits occur nearby, there is moderate certainty that uranium and vanadium occur somewhere in the WSA. It is significant to note, however, that no mining has taken place in this unit even during times of high ore prices and strong market conditions. The uranium deposits may underlie all 24,190 acres of the WSA.

Uranium mines in the Chinle Formation surrounding the WSA all contain some copper. The amount, however, is small, and copper can be recovered only as a byproduct of uranium production. The Chinle has been eroded away and is generally missing from the WSA. The Cutler Formation is the only unit in the WSA that has produced uranium in the vicinity of Butler Wash. The Cutler Formation in the WSA is not considered

favorable for uranium or vanadium because it lacks in uranium anomalies, organic carbon, and sandstone. Therefore, copper is assigned a low favorability rating (less than 50,000 tons of contained copper) and a low certainty rating for resource occurrence.

Other locatable minerals such as lead, zinc, and silver are essentially absent from the sedimentary units of the Colorado Plateau except in areas of igneous intrusion. Approximately 20 acres of surface disturbance could take place from mineral exploration and development from future claim location.

SALABLE MINERALS

The salable minerals within the WSA have little or no commercial potential. The poor quality and quantity of the materials available and the remote nature of the deposits render them of little value as a resource.

Wildlife

Mule deer utilize the WSA during the winter. Most of the deer use is along the west and south boundaries adjacent to Beef Basin from October through April. Bobcats and mountain lions inhabit the rocky rims of the WSA. Coyotes, cottontail rabbits, and pinyon mice are also in this area. Red-tailed hawk, American kestrel, Cooper's hawk, common raven, pinyon jay, plain titmice, and rock wren are found in the WSA. Reptiles and amphibians, including the side-blotched lizard, northern plateau lizard, sagebrush lizard, and Great Basin gopher snake, are commonly observed in this area.

No habitat improvements have been identified within the WSA and no management facilities exist. No transplants are currently proposed.

No threatened or endangered species have been identified in this WSA by the FWS. There are no acres classified as crucial or Federally designated critical habitat.

Forest Resources

There are approximately 17,000 acres of pinyon-juniper woodland in the WSA. These are low quality sites (less than 20 cubic feet usable wood per acre) and are considered nonproductive forest land. At the present time, opportunities for pulp and papermaking are low. No areas near the WSA have been designated as Christmas tree cutting areas. It is estimated that less than 2,656 cords of firewood are located in the WSA. The area receives little if any use for firewood gathering.

No fenceposts are cut in this WSA. It is unlikely that any firewood was gathered from this WSA due to the distance from population centers. Pinyon nuts may be gathered occasionally by recreationists, but there have been no commercial gathering permits issued for areas near this WSA.

Livestock and Wild Horses/Burros

The WSA is within the Beef Basin Pasture of the Indian Creek Grazing Allotment. Table 6 summarizes allotment grazing use.

Very little grazing use occurs in the WSA because of the steep, rugged topography that hinders access and the scarcity of usable forage. The grazing that occurs is primarily in the sagebrush parks adjacent to or in Beef Basin. Beef Basin is grazed by about 200 cattle from December 1 through June 15 each year. Vehicular access for livestock management does not occur in the WSA.

Estimated forage production in the WSA is approximately 206 AUMs. Estimated use is about 32 cattle for the December 1 through June 15 season (actual use may be considerably less).

There is one livestock reservoir in the WSA and two reservoirs just outside the WSA boundary in Middle and Ruin Park. There are no range improvements proposed for the WSA.

There are no wild horses or burros within the WSA.

TABLE 6

Livestock Grazing Use Data

	Indian Creek Allotment
Class and Number of Livestock	Cattle 1,065
Number of Operators	1
Season of Use	10/16 to 6/15
Total AUMs	8,518
AUMs in WSA	206
Total Acres	236,890
Acres in WSA	21,000
Percent of Allotment in WSA	9

Source: USDI, BLM, 1968.

Visual Resources

The WSA has both VRM Class II (11,630 acres, 48 percent) and IV (12,560 acres, 52 percent).

Class A scenery, which occupies 11,369 acres (47 percent) of the WSA, is located along the bound-

ary of Canyonlands National Park where rock outcrops are very similar to those in the Park. Class A scenery combines the most outstanding characteristics of the physiographic region. This unit scored the highest of five units evaluated in the Beef Basin Planning Unit.

Class B scenery, which occupies 10 percent (2,419 acres) of the WSA, is located in the House Rock area.

Class C scenery, which occupies 43 percent (10,402 acres) of the WSA, is located near the southwestern boundary of the WSA. This area is typified by low rolling landforms with little relief.

The entire WSA is located in the foreground/middleground distance zones. (Refer to Appendix 7 for a description of BLM's VRM rating system.)

The landscape character of the WSA consists of three major types of landforms: relatively flat, open parks; high buttes and sandstone domes; and highly eroded canyon systems.

The parks located near the southwestern boundary have wide, flat drainages and little relief. Interesting landscape features are lacking. The vegetation of the parks is sagebrush and grasses with sparsely scattered pinyon and juniper on the slopes.

The buttes and domes separating the parks rise up to 750 feet above the flats. The erosional patterns have created interesting landscape features. Colors of the landforms are buff and pink, and textures are smooth when viewed up close and coarse when viewed from the distance.

The canyon systems have severe surface variation such as sandstone pinnacles and spires and are similar to rock outcrops in Canyonlands National Park. The canyons have alternating bands of red-and-gray sandstone which create a great deal of contrast with the dark-green pinyon-juniper.

Two human modifications have been identified within the WSA boundaries: a stock reservoir and a traveled way. Both of these modifications create low contrast on the landscape.

Cultural Resources

No significant archaeological work has been conducted in the Butler Wash area. Little is known about the cultural resources of the general area north of the Abajo Mountains, except that site densities are lower here than in most of San Juan County and this locale is transitionally situated between Fremont and Anasazi cultural groups. The Anasazi culture includes both Basketmaker and Pueblo groups.

Because of the relative difficulty in access into the Butler Wash WSA, it potentially contains numerous pristine cultural resources. A literature search revealed seven recorded archaeological sites within the unit. These include mostly late Pueblo-type sites of the Anasazi culture. Pictographs and storage structures remain in mostly pristine condition. Because storage structures (granaries) are tucked among rock ledges and well hidden, there are undoubtedly more sites than have been recorded.

The WSA is located in a transition area between Fremont and Anasazi cultural groups. Scientifically, the cultural significance of this WSA lies in the potential for better understanding the interrelationships between these peoples. The unique rock art in this area quite possibly holds the key toward establishing the nature of this contact.

There are no existing National Register sites and/or nominations in this WSA. However, based on estimates from similar settings in the area, it could be expected that 860 sites would be located in the WSA, of which 574 would be National Register eligible.

Historic activity in the WSA primarily relates to use of the range for cattle and sheep grazing. Physical evidence remaining from this land use includes a short brush fence in Butler Wash itself and a stock trail leading from upper Butler Wash into Beef Basin.

Recreation

The outstanding scenery, including interesting geologic features in the WSA, provides a variety of recreational opportunities, including photography, sightseeing, hiking, and backpacking.

Private recreational activity in Butler Wash WSA has not been monitored by BLM and no accurate information is available as to type and numbers of recreational users of the area. However, 344 user days were recorded in the WSA from September 1981 through August 1982. This figure represents backpackers entering the WSA through Canyonlands National Park with permits by the National Park Service (NPS) (Steele, 1982). Commercial use of the WSA (National Outdoor Leadership School, Colorado Outward Bound) amounted to approximately 100 user days in 1982, 280 user days in 1981 and 1980, and 100 user days in 1979.

The area is currently open to ORV use. Motorized use of the WSA is limited to Butler Wash up to Starvation Pocket. Travel further up Butler Wash

is prohibited by the rough terrain. Private vehicle use on this route has historically occurred, but with a marked decrease over the past 3 years due to the area being closed to deer hunting. Commercial vehicle use of the area (Tag-a-Long Tours and Canyonlands Tours) has occurred very sporadically with the last recorded (permitted) trip being in 1978. The NPS estimates a total of one to two vehicles per year have entered Butler Wash WSA through the Park since 1980 (Steele, 1982).

The recreational use of the WSA is currently estimated at 444 visitor days annually. Approximately 100 visitor days are related to commercial outfitting (horses and vehicular use). Approximately 97 percent of the use is attributed to primitive activities. There is approximately 3 percent attributed to use solely for ORV play activities.

The WSA is within Deer Herd Unit 31B, which was closed to hunting during the 1980 to 1983 seasons due to extremely low populations and productivity. Prior to the closed seasons, a few hunters regularly hunted in Butler Wash.

Wilderness Values

SIZE

The WSA contains 24,190 acres of public land, which is of sufficient size to enhance the wilderness values present. Additionally, the WSA is adjacent to NPS's Needles proposed wilderness (61,182 acres). The WSA is approximately 16 miles long (north to south) and 8 miles wide (east to west) at its longest and widest points.

NATURALNESS

This entire WSA retains its natural character. The unit is remote and rugged. It takes over 30 miles of graded dirt road to reach it from Dugout Ranch on Highway 211 or as many miles of jeep trail through Canyonlands National Park. The steep slopes at the heads of drainages in the unit's southern portion effectively prevent vehicle travel and ledges and boulders in the mid-portion of the washes make wheeled travel difficult. In the lower portions of the washes four-wheel drive vehicles sometimes travel into the northern part of the unit. Specifically, vehicles have been known to travel on a 2-mile vehicular way up Butler Wash to an open park in a side canyon (Starvation Pocket). Seasonal rains erase evidence of wash bottom travel, and the only evidence of vehicle travel is where wheel tracks have left the wash bottom for less than one-eighth mile.

The roads, abandoned drill holes, and reservoirs just outside the unit's southern boundary are well screened from the interior of the WSA. Only one reservoir, old and deteriorating, is actually within the unit, on the northeast edge of Ruin Park.

These imprints cover less than 1 percent of the WSA and meet the naturalness standard for areas under wilderness review. The entire WSA acreage (24,190 acres) is considered natural in character.

SOLITUDE

The topography and isolated nature of the unit contribute to the outstanding opportunities present. The Salt Creek canyons in the unit's southeast and the Needles of the east and northeast offer outstanding opportunities for the user to feel isolated in a secluded place. The meandering canyons of Butler Wash offer more than adequate opportunities for solitude.

The undeveloped and remote nature of Canyonlands National Park is well known. Butler Wash WSA is contiguous with the Park on both the north and the east. The isolated and remote nature of the maze of parks in the Needles District and the canyons of Salt Creek is shared by the Butler Wash WSA.

Off-site intrusions on solitude would be road cuts on high points east of House Park and an old road cut around a butte on the unit's southern boundary. The other human imprints south of the WSA are well screened from the interior of Butler Wash with steep buttes between them and the lower terrain of the unit.

In summary, the WSA meets the outstanding solitude criterion on all 24,190 acres.

PRIMITIVE AND UNCONFINED RECREATION

The opportunities for dispersed, undeveloped recreation within this unit are excellent. Natural parks ringed by colorful sandstone spires and knobs, the interesting rock forms and colors of upper Salt Creek watershed, and Indian ruins and rock art all provide focal points of interest to the dayhiker or backpacker. Hiking is easy in the wash bottoms and climbing to high points offers spectacular views over the unique redrock countryside. The sandstone of the unit provides challenging terrain and numerous opportunities to climb and explore. The parallel fracturing in the rocks of the area and erosion have created many narrow passageways that would draw the curious and adventurous.

Other forms of unconfined recreation possible in Butler Wash include photography, drawing, and

sightseeing for botanical, zoological, or geological features.

The combination of outstanding hiking and camping opportunities along with the archaeological and scenic resources allows all 24,190 acres of this WSA to meet the outstanding primitive and unconfined recreation criteria.

SPECIAL FEATURES

Butler Wash WSA contains cultural (archaeological and early cowboy use) and scenic values that are of supplementary interest.

The WSA contains seven recorded cultural sites. In addition, several additional sites were observed during field work on this unit but not recorded. There is a potential for 860 sites in the WSA. (Refer to the Cultural Resources section for additional information.) These cultural resources enhance other wilderness values by lending a sense of timelessness to the area in which human use of the land seems short in comparison to the natural forces that shaped it.

The scenic value of the unit is high, especially in the northeast and southeast. In the northeast, the Needles country becomes prominent. Red-and-buff sandstone spires, knobs, and buttes contrast with the green vegetation and blue sky. In the southeast, the heads of Salt Creek (most of which is in Canyonlands National Park) cut a myriad of shapes in the colorful sandstone.

Evidence of early century cowboy use exists within the unit and adds to an understanding of the historical use of the land. One short brush fence exists in Butler Wash itself and evidence of an old horse or stock trail exists at the head of Butler Canyon leading from Beef Basin.

Land Use Plans and Controls

There are no existing or proposed rights-of-way within the WSA. There are four sections of State land (2,560 acres) within the boundaries of the WSA. All other lands within the WSA are public lands administered by BLM. State lands within the WSA are under oil and gas leases. The management philosophy for all State sections is to maximize economic returns for the State school fund.

Canyonlands National Park adjoins the WSA along the north and east borders. The NPS has proposed the adjoining portions of the Park for wilderness designation. Three State sections are adjacent to the WSA. The majority of the south and west boundaries of the WSA adjoins public land.

The Beef Basin Planning Unit MFP was completed by BLM in 1973. Important features of the MFP include continuing domestic livestock grazing and delineating oil and gas categories and VRM classes as identified in the No Action Alternative.

The WSA is in San Juan County. The *San Juan County Master Plan* (Planning and Research Associates, 1967) emphasizes multiple use of public lands and zones the WSA as range and forest lands. The Master Plan predates wilderness considerations. However, the San Juan County Commission (1980) opposes any wilderness areas being legislatively or administratively designated in the County.

Socioeconomics

DEMOGRAPHICS

The WSA lies in northwestern San Juan County. The nearest community is Monticello, being approximately 55 road miles from the WSA. The socioeconomic effects of designation would be confined mostly to San Juan County. This county can be summarized as rural and sparsely populated.

San Juan County had a 1982 population of 12,700, not quite 1 percent of the State population (University of Utah, Bureau of Economic and Business Research, 1982). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers. Monticello, the county seat, had a 1980 population of 1,930 and Blanding, about 20 miles south, had a 1980 population of 3,120 (U.S. Department of Commerce [USDC], Bureau of the Census, 1981).

San Juan County is one of the largest counties in Utah, comprising 7,885 square miles (about the size of New Jersey). About 85 percent of the county is owned by the Federal Government, 6 percent by the State of Utah, and 8 percent by private landowners (University of Utah, Bureau of Economic and Business Research, 1982). The southern 20 miles of the county are included in the Navajo Indian Reservation.

EMPLOYMENT

Even though local employment in the mining industry decreased by 20 percent between 1980 and 1982 due to a downturn in local uranium mining and milling it still remains the largest local private employer (refer to Table 7).

TABLE 7

1981 Employment and Income
San Juan County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance, and Real Estate	1	1
Services	8	11
Other	—	—
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	96
Unemployment (1st Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

NOTE: Employment percentage figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services. Because of rounding, numbers are not additive.

Recent statistics indicate that mining directly accounts for half of the income and over 32 percent of the employment in the county (USDC, Bureau of Economic Analysis, 1982). Because the mines and mine employees purchase products locally, mining's total local importance is even greater. Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are on welfare and are therefore not included in unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

INCOME AND REVENUES

Economic-related activities in the WSA include livestock production and recreation. Table 8 summarizes local income and Federal revenues from the WSA. Appendix 9 identifies the multipliers used to estimate income and revenues.

The WSA has no mining claims; therefore, no assessment fees are realized. No oil and gas wells have been drilled in the WSA nor has oil and gas or mineral production occurred. Therefore, mineral and energy resource production from the WSA has not contributed to local employment or income.

TABLE 8

Local Sales and Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	$25,740
Livestock Grazing	$4,120	$288
Recreational Use	Less than $1,820	$100
Total	Less than $5,940	Up to $26,128

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total local income that would be generated by these expenditures.

One livestock operator has a total grazing privilege of 206 AUMs within the WSA. If all this forage were utilized, it would account for $4,120 of livestock sales and $1,030 of ranchers' returns to labor and investment.

Some woodland products may be harvested from the WSA; however, the harvests have been small and are insignificant to the local economy and only of minor significance to those involved in the harvest.

The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for Butler Wash WSA is estimated as about 444 visitor days per year. Only a portion of the expenditures for recreational use of the WSA contribute to the local economy of San Juan County.

Recreation-related expenditures would be significant only to the two commercial outfitters who make use of the WSA, neither of which is based locally. Commercial use of the WSA accounts for approximately $5,000 of sales that do not go to the local economy.

The WSA generates Federal revenues from mineral leases, livestock grazing, and recreation sources (refer to Table 8).

Oil and gas leases in the WSA cover approximately 8,580 acres. At $3 per acre, lease rental fees generate up to $25,740 of Federal revenues annually. Half of these monies are allocated to the State, which then reallocates these revenues to various funds, the majority of which are related to energy development and mitigation of local impacts of energy and mineral development.

Average actual livestock use and, therefore, revenues generated from grazing in the WSA are unknown; however, the permittee in the WSA can use up to 206 AUMs per year. Based on a $1.40 per AUM grazing fee, the WSA can potentially generate $288 of grazing fee revenues annually, 50 percent of which would be allocated back to the local BLM district for the construction of rangeland improvements.

Based on issuing an average of 100 user day permits/year and an average permit fee of $1.00 per user day, recreation permits generate about $100 of Federal revenues annually.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from: (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without control for wilderness protection. The degree of future development is unknown, but would probably be low due to the WSA's rough terrain and limited resource potential. The following is a worst-case analysis, based on the assumption that minerals would be developed sometime in the future and would result in the following disturbance: potash, 420 acres; oil and gas, 160 acres; and uranium/vanadium/copper, less than 20 acres. (Appendix 10 lists surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed by the State of Utah as a PSD Class II area. Disturbance of 600 acres would result in only minor increases in fugitive dust emissions.

GEOLOGY

No impacts to geology are expected because surface disturbances associated with locatable minerals (i.e., uranium/vanadium/copper), oil and gas, and potash exploration and development activities would probably not exceed 600 acres. This would not significantly affect the geologic structure of the area.

SOILS

It is estimated that up to 600 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.26 cubic yard/acre/year. Where soils are disturbed, soil loss would increase to about 1.35 cubic yards/acre/year. Soil loss on the 600 acres would increase from 156 cubic yards/year to 810 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 654 cubic yards (10 percent) over the current annual soil loss. However, the potential for development of energy and mineral resources in the WSA is low.

VEGETATION

The anticipated maximum of 600 acres disturbed could result in loss of as much as 3 percent of the area's sparse vegetation until reclamation is completed. No major changes in vegetation type would be expected.

Some individual plants of the BLM sensitive species *Astragalus monumentalis* could be inadvertently disturbed. Before authorizing surface-disturbing activities (600 acres potential), the BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken, it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be preserved with the No Action Alternative.

WATER RESOURCES

Since precipitation is low and all streams are ephemeral within the WSA, no significant sedimentation or change in TDS is expected to occur from the 600 cubic yards of annual soil loss from surface disturbance. Opportunities for maintenance, improvement, or expansion of existing water sources could occur as allowed in the Beef Basin MFP. No developments are currently planned.

Mineral exploration and development in the area is generally confined at or near the surface or with widely spaced wells; therefore, in most cases, these activities would not significantly impact ground water. However, development of potash, depending on methods used, could result in a reduction of ground water quality. There are, however, no springs or wells in the WSA.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

The potential for up to 10 million barrels of oil in-place (3 million estimated recoverable) and up to 60 billion cubic feet of natural gas (18 billion estimated recoverable) exists within the WSA. These oil and gas resources could be explored and developed, subject to Category 1 (standard stipulations) on 3,890 acres, Category 2 (special stipulations) on 2,620 acres, and Category 3 (no surface occupancy) on 8,320 acres. Approximately 9,360 acres would be managed under Category 4 (closed to leasing). As much as 160 acres of surface disturbance would take place if exploration and development were to occur. However, due to the small size of these deposits, no development is expected under this alternative.

Potash

The entire WSA would be open to potash leasing. If potash occurs within the WSA, the deposits will generally contain less than 1 million tons of potash, with less than 750 thousand tons estimated to be recoverable. Under this alternative, these potash resources could be developed without concern for wilderness values. There is little likelihood that potash would be developed in the WSA in the near future. There are no leases for potash in the WSA. The potential for potash development in the WSA is low, as other proven reserves are present elsewhere in the region.

LOCATABLE MINERALS

Locatable mineral development could occur within the WSA. The entire WSA would remain open to mining claim location. The potential deposit of up to 50,000 tons of copper and up to 500 tons of uranium oxide could be developed without wilderness considerations. Approximately 20 acres could be disturbed due to exploration and development of these locatable mineral resources. However, the likelihood of development is thought to be minimal because of economic considerations (i.e., transportation, low potential, etc.).

WILDLIFE

Disturbance of an estimated 600 acres through mineral and energy development and exploration would disrupt wildlife during the period of activity. Deer, bobcats, mountain lions, and mobile nongame animals would be dispersed from the disturbed area for the lifetime of these activities. Less mobile wildlife would either perish or coexist with these disturbances at smaller and less viable population levels. No threatened or endangered or BLM sensitive species would be affected because none are present within the WSA. Under this alternative, wildlife could be positively affected by development of water catchments or reservoirs without wilderness considerations, but none are planned at this time.

FOREST RESOURCES

Since there are few trees other than scattered pinyon and juniper, none of which are utilized (except possibly by occasional campers or hik-

ers), and since minimal surface-disturbing activities are anticipated, no loss or harvest of forest resources is expected under this alternative.

LIVESTOCK

Domestic livestock grazing would continue as authorized in the current BLM planning document. The 206 AUMs currently allocated in the WSA are controlled by one livestock permittee. The existing earthen reservoir could be maintained as in the past. Although additional roads or other facilities for livestock handling could be proposed and developed in the future without regard for wilderness values, none are currently planned. Motorized vehicles are currently not used to manage livestock in the WSA, and probably would not be used in the future. Few, if any, changes in livestock management techniques are expected. Livestock forage would be reduced by as much as 3 percent from mineral- and energy-related disturbance. However, only about 2 percent of the AUMs in the Indian Creek Allotment are within the WSA, so the impact would be insignificant to livestock operations.

VISUAL RESOURCES

Under this alternative, 600 acres of mineral-related exploration and development are possible. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. VRM objectives would probably not be met in Class II areas during the short term. Even after rehabilitation, some permanent localized degradation would be expected. If roads, vehicular ways, and drill pads are located throughout the area (worst-case analysis), visual quality could be significantly reduced in the WSA as a whole.

CULTURAL RESOURCES

Disturbance of 600 acres by mineral and energy exploration and development under this alternative could cause inadvertent damage or loss to cultural resources (860 potential sites, of which 574 are potentially National Register eligible). However, inventories for the purposes of site recordation and mitigation would take place prior to any surface disturbance and would mitigate impacts. Stabilization efforts and excavations would be easy to conduct under this alternative because protection of wilderness values would not be an issue.

RECREATION

Potential adverse impacts to the primitive and unconfined recreation experience could occur as a result of nonwilderness designation. The 600 acres of possible surface-impacting activities would reduce the amount of land available for primitive recreational activities and also would reduce the quality of this type of recreation. If roads, vehicular ways, and drill pads were located throughout the WSA (worst-case analysis), primitive recreational opportunities could be lost in the area altogether. Nonmotorized recreation uses would probably increase until such time as incompatible uses removed the opportunities for these types of activities. Motorized activities would be allowed and would be in conflict with nonmotorized uses where their areas of use overlap. In contrast, motorized recreation users would benefit from additional lands being available for motorized use, and from roads and ways being located in the area for mineral and energy development.

The future trends in recreational use of the WSA are unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use is expected to increase from 444 current visitor days per year to approximately 662 visitor days at the end of 20 years.

Commercial outfitting opportunities would not benefit. Eventually, primitive recreational use could decline as vehicular use increased.

WILDERNESS VALUES

None of the area would be designated wilderness, and management would be under the existing Beef Basin MFP until superseded by the San Juan RMP. Expected mineral and energy exploration and development could disturb as much as 600 acres. Wilderness values in this WSA (i.e., naturalness, opportunities for solitude and primitive recreation, and special features) could be lost or diminished in affected areas. Mineral-related surface disturbance could result in significant loss of naturalness and solitude throughout the WSA as a whole if roads, vehicular ways, and drill pads are located throughout the area. The potential for mineral development and related disturbance is, however, low in this WSA. Opportunities for solitude and primitive and unconfined recreation could be lost or reduced, not only due to surface disturbance, but also due to allowance of motorized uses. Due to inaccessibility, wilderness values would remain in some portions of the WSA.

LAND USE PLANS AND CONTROLS

This alternative would generally be consistent

with the *San Juan County Master Plan* because existing uses would continue. There would be no conflict with current zonings. However, continuation of the oil and gas leasing closure on 9,360 acres would probably not be consistent with the county's multiple-use concept.

This alternative would not complement the potential wilderness management of adjacent NPS lands. While no designation would not affect potential wilderness designation of NPS lands, impacts caused by mineral development could interfere with the wilderness experience on these adjacent lands.

The No Action Alternative would be consistent with the State of Utah policy to emphasize economic return. It would be in conformance with the existing Beef Basin Planning Unit MFP or forthcoming San Juan RMP because existing uses would continue.

SOCIOECONOMICS

Under this alternative, no changes are expected in existing patterns and trends of population, employment, and local income distributions. Economic development of resources in the WSA would not be affected. There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the oil and gas, potash, uranium, vanadium, and copper in the WSA were developed it would increase employment and income for San Juan County. However, the probability of economic development of minerals within the WSA is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the existing grazing use (206 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to be approximately 662 visitor days per year in 20 years and overall recreation-related expenditures average only $4.10 per visitor day (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA would likely not be significant to the local economy.

Surface-impacting activities that would be allowed without designation could reduce the demand for commercial outfitter services now offered in the area. Decreased demand would be significant to the nonlocal commercial outfitters who use the WSA but would be insignificant in terms of the local economy and other individual businesses.

Federal and State revenues would not be reduced by this alternative. There are 6,250 acres in the WSA open to oil and gas leases that are currently not leased. If leased, they would bring up to $18,750 additional Federal lease fee revenues per year. Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees (currently $288 per year) would continue. About 50 percent of the revenues would be returned to the local BLM office for use in range improvement projects.

All Wilderness Alternative (24,190 Acres) (Proposed Action)

As identified in the Description of the Alternatives section, the major changes that could occur in the 24,190-acre area would be related to its withdrawal from mineral location and closure to new mineral leasing and sale. The entire area would be placed in leasing Category 4 (closed to leasing). The entire area, including about 2 miles of existing vehicular way in the WSA, would be closed to vehicular use except for approvals by BLM as discussed in the Description of the Alternatives section. The WSA would be managed under VRM Class I.

For the following analysis it is assumed that mining claims would be filed prior to designation and would eventually be explored and developed, causing up to 20 acres of disturbance within the WSA. It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed, and future leasing of oil and gas or other leasable minerals (e.g., potash) would not be allowed. (Appendix 10 lists surface disturbance assumptions and estimates for the WSA.)

Because potentially disturbed areas for this alternative would be smaller than under the No Action Alternative (20 vs. 600 acres), the impacts from development and surface disturbance on air quality, geology, vegetation, livestock, forest, wildlife, and cultural resources under the All Wilderness Alternative would be insignificant. Wilderness designation would provide additional protection to these resources as compared to the No Action

Alternative because it would reduce potential for disturbance. Other effects on these resources due to changes in management are discussed below.

SOILS

It is estimated that up to 20 acres of soil could be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.26 cubic yard/acre/year. Where the surface is disturbed, soil erosion would increase to approximately 1.35 cubic yards/acre/year. Soil loss on the 20 acres would increase from approximately 5 cubic yards/year to 27 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 22 cubic yards over current annual soil loss of 6,290 cubic yards. This is approximately 632 cubic yards less than the No Action Alternative.

WATER RESOURCES

Opportunities for watershed improvements could be limited because wilderness protection criteria must be met. No improvements are currently planned. Wilderness designation would protect the quality of ground water in the WSA because potash development, which has the potential for degrading ground water quality, would not occur.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Approximately 8,580 acres are under oil and gas leases. However, no exploration or development of oil and gas is presently occurring within the WSA.

Existing pre- and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases will be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases will not be reissued.

Exploration for and development of a potential resource of up to 10 million barrels of oil in-place and less than 60 billion cubic feet of natural gas (3 million barrels of oil and 18 billion cubic feet of natural gas that are recoverable) could be foregone under this alternative. However, due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities, it is concluded that this alternative would not result in any significant loss of potential oil and gas recovery.

Potash

Potash potential is rated as low (less than 1 million tons, with less than 750 thousand tons considered recoverable). There are currently no potash leases in the area. Therefore, the opportunity to recover the potash resource would be foregone under this alternative. It is, however, unlikely that the potash resource would be developed even without wilderness designation.

Locatable Minerals

There are currently no mining claims within the WSA but claims could be filed prior to designation. Up to 500 tons of uranium oxide and up to 50,000 tons of associated copper could occur within the WSA. Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation under unnecessary or undue degradation guidelines, with consideration given to protecting wilderness values. If minerals are located prior to wilderness designation, it is estimated that up to 20 acres could be disturbed due to exploration and development of the locatable mineral resources. The worst-case impact to minerals would occur if the potentially recoverable minerals are not within mining claims filed prior to designation. In that case the potential for recovery of up to 500 tons of uranium oxide and 50,000 tons of copper would be foregone.

WILDLIFE

Under this alternative wildlife would benefit due to the preservation of solitude. Disturbance due to exploration of locatable mineral resources could disrupt wildlife populations and result in mobile species leaving the disturbed areas. However, impacts are not expected to be significant due to the small amount of disturbance that could occur under this alternative.

No threatened, endangered, or sensitive species would be affected because none inhabit the WSA.

LIVESTOCK

Present domestic livestock grazing would continue as authorized in the Beef Basin Planning Unit MFP. The 206 AUMs currently allocated in the WSA are controlled by one livestock permittee.

The one existing earthen reservoir would be maintained as in the past, based on practical necessity and reasonableness. New rangeland improvements would be allowed if determined

necessary for the purposes of rangeland and/or wilderness protection and the effective management of these resources. However, development of future roads or other livestock management facilities for use with the 206 AUMs in the WSA could be restricted to preserve wilderness values. Since very little, if any, use of motorized vehicles is currently taking place to manage livestock and no rangeland improvements or land treatments are currently planned for this WSA, little effect on the management of livestock grazing is expected.

VISUAL RESOURCES

Wilderness designation would contribute to the preservation of the area's visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I, which generally allows for only natural ecological change, through ORV closure, and through closure of the entire area to future mineral leasing and location.

Under this alternative, potential mineral-related surface disturbance would be reduced from 600 acres to 20 acres, associated with development of valid mining claims. Although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation, some permanent localized degradation could be expected. Because the potential for development of mining claims is low and wilderness designation would reduce the potential for surface disturbance, visual quality would probably not be reduced in the WSA as a whole.

CULTURAL RESOURCES

Approximately 20 acres could be disturbed by mineral exploration and development; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any and all proposed surface disturbance and would mitigate any adverse impacts. Inadvertent loss or damage to cultural resources could occur, although these impacts are expected to be minimal.

There is potential for increased vandalism to cultural resources due to increased recreational use of the WSA. However, protection afforded by wilderness management would outweigh any potential vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

Although use is currently low (approximately 444 visitor days per year), the WSA has outstanding primitive recreational values. If designated, those high-quality recreational opportunities would be recognized, managed, and protected.

As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an increase in primitive recreational use above the baseline rate. Judging from use densities of a number of well known wilderness areas, proposed wilderness areas, and primitive areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites, it is estimated that following designation use could be as much as 4,838 visitor days per year (USDI, BLM, 1985). This is 4,394 visitor days (999 percent) over the area's current estimated 444 annual visitor days. Management provided through a Wilderness Management Plan would control destructive increases in future recreation use, and the quality of the primitive recreation experience probably would not be negatively affected by the increased use.

Mineral-related surface disturbance on up to 20 acres could cause localized impairment of recreational values. Because the potential for mineral production is low to moderate and wilderness designation would reduce the potential for surface disturbance, the quality of the primitive recreational experience would likely be preserved throughout the area as a whole.

Little impact on ORV recreational use from the ORV closure would be expected due to the lack of such activity in the area and the availability of ORV use in the general vicinity. The ORV closure would eliminate the potential for conflicts with nonmotorized recreationists.

It is concluded that this alternative would benefit recreation by reducing the likelihood for surface-disturbing activities and increasing management's recognition of the area's primitive recreational values.

WILDERNESS VALUES

Designation and management of all 24,190 acres as wilderness would contribute to the preservation of the wilderness values of size, naturalness, and outstanding opportunities for solitude and primitive and unconfined recreation, contained throughout the entire WSA. The special features in this WSA (i.e., cultural and scenic values) would also be protected and preserved.

Increased recreational use could decrease opportunities for solitude because of the limited number of canyons and limited access points that would tend to concentrate recreational activities; however, adjacent NPS lands would help disperse use. Therefore, no significant effect on solitude and primitive recreational values would be expected.

Wilderness designation would contribute to the preservation of the area's wilderness values. Under this alternative, the potential for surface-disturbing activities that could impair wilderness values would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through an ORV closure, and through closure of the entire area to future mineral leasing and location.

No development of leases is foreseen under this alternative. The possible mineral-related surface disturbance would, therefore, be reduced from 600 acres to 20 acres for development of valid mining claims. Mitigation to protect wilderness values would be considered during mining claim development, but road construction and use of motorized equipment could be allowed for development of valid mining claims if there are no reasonable alternatives. There are currently no mining claims in the WSA and potential for mineral development is low. Mineral-related disturbance, including access roads, would eliminate solitude, naturalness, and the opportunity for primitive and unconfined recreation on the affected areas. However, because possible mineral-related disturbance would be reduced and mitigation would be imposed to protect wilderness values, loss of wilderness values in the area as a whole after designation would be much less likely than if the area were not designated wilderness.

Designation of the WSA as wilderness would benefit the wilderness values and uses of the contiguous NPS lands.

LAND USE PLANS AND CONTROLS

The *San Juan County Master Plan* emphasizes multiple use for public lands and zones this area for open range and forest land. This alternative would not totally conflict with the county's multiple-use concept since many existing resource uses would continue, although under more restrictive conditions. This alternative would conflict with the county's multiple-use concept where restrictive conditions would be placed on mineral development and oil and gas leases would be phased out.

The Beef Basin Planning Unit MFP does not provide for wilderness designation; the San Juan RMP scheduled for completion in 1986 will acknowledge the wilderness study but will not cover wilderness designation. Designation of the WSA as wilderness would be an amendment to the applicable BLM land use plan.

A wilderness recommendation would complement the proposed adjacent wilderness area in Canyonlands National Park. State lands within the WSA could be exchanged; thus, wilderness designation would not conflict with the policy of the State of Utah to maximize economic returns.

SOCIOECONOMICS

Overall there would not be significant changes in current trends of population, employment, and local income distribution.

Because of restrictions placed on the use of resources under wilderness designation there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 8) as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative.

The potential for mineral development in the WSA is low (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Valid existing oil and gas leases and mining claims could be developed but designation would preclude new leases and claims from being established in the WSA. Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they would be with mineral development under the No Action Alternative. Because the potential for mineral development is low, it is estimated that potential mineral-related local income would not be significantly reduced by wilderness designation. However, any local income related to assessment of future mining claims would be lost.

Livestock use and ranchers' income would continue as at present with $4,120 of livestock sales and $1,030 of ranchers' return to labor and investment. No potential range improvements have been proposed that would result in increased ranchers' income.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section). Related local expenditures would be as much as $19,836 annually (average of $4.10 per visitor day statewide). Increased use would be significant to the two commercial outfitters who now use the

WSA and those that may begin to use the WSA. Motorized recreational use of the WSA is light. The decrease in related local expenditures would be small and insignificant to both the local economy and individual businesses.

Wilderness designation would eliminate the potential for woodland product harvesting and related Federal revenues. No harvest is taking place at present in the WSA.

No existing rights-of-way or permits would be eliminated through wilderness designation.

Recreation-related Federal revenues could increase if the demand for commercial outfitter services increases. There are presently two commercial outfitters using the WSA, and designation could lead to more commercial recreational use in the WSA.

The loss of leases on 8,580 acres now leased would cause an eventual loss of up to $25,740 per year of lease fees to the Federal Treasury. There would also be a potential loss of $18,750 annually in Federal revenues from the 6,250 acres that could be leased without designation.

ADDENDUM

In December 1985 it became apparent that an isolated parcel of BLM-administered Federal public land exists between the Butler Wash Wilderness Study Area (WSA) and the Needles Wilderness Proposal for Canyonlands National Park. This parcel is identified as the South Needles WSA (UT-060-169A) under Section 2 of FLPMA.

The legal description of the parcel is: Township 32 South, Range 19 East, Section 2: Lots 1 and 2; South ½ Northeast ¼ 160.15 acres, (Salt Lake Base and Meridian). The parcel is separated from the Butler Wash WSA by 0.5 mile of State land. The State land has been identified by the State of Utah for exchange if the Butler Wash WSA is designated as wilderness, since that State section would be isolated between the BLM wilderness area and Canyonlands National Park. The South Needles WSA is covered by a public water reserve. There are no developments, and the parcel remains substantially natural. It is similar in character to both the Butler Wash WSA and the adjacent proposed wilderness area in Canyonlands National Park.

On the BLM land status printed base map series, this tract is shown as State-owned land. During the wilderness inventory in 1979-80, it was not known that the isolated parcel was Federal land.

If this parcel had been identified as a WSA during the inventory, it may have been among the parcels dropped by Secretary Watt in 1982 (parcels of less than 5,000 acres contiguous with a wilderness proposal of another agency). These parcels were reinstated as "Section 202" WSAs as a result of Sierra Club vs. Watt (1985).

As authorized by Sections 202 and 302 of the FLPMA of 1976, BLM reviewed the parcel and found that it met the criteria for designation as a WSA, if considered in conjunction with the adjacent Canyonlands National Park. Lands within the South Needles WSA share the resource values and wilderness characteristics described in the analysis for the Butler Wash WSA; therefore, a separate analysis has not been prepared for the South Needles WSA. However, the area will be carried through the wilderness review as a separate WSA; public comments addressing the wilderness suitability of this area should be explicitly identified for UT-060-169A. Because identification of the South Needles WSA did not occur until preparation for the Utah Statewide Wilderness Draft EIS was in the final stages, statewide acreages and other totals in Volume I do not include the lands in the South Needles WSA.

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Bridger Jack Mesa WSA

BRIDGER JACK MESA WSA
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BRIDGER JACK MESA WSA

(UT-060-167)

INTRODUCTION

General Description of the Area

Bridger Jack Mesa Wilderness Study Area (WSA) is in the Canyonlands region of San Juan County. The WSA covers 5,290 acres of public land administered by the BLM. The *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980) stated that the area encompassed 5,300 acres; however, recalculation indicates that 5,290 acres is more accurate. Bridger Jack Mesa is 18 miles northwest of Monticello, Utah. North Cottonwood Canyon is east of the mesa, and Lavender Canyon borders the mesa on the west. The southern end of the mesa is 0.25 mile from the boundary of Canyonlands National Park. Sheer cliffs that drop 800 feet from the mesa rim to the benches below limit access to this WSA.

The major feature of the WSA is Bridger Jack Mesa, a long, narrow mesa top (approximately 10 miles long and 1 mile wide) running southwest-northeast. The mesa top is relatively flat in the south, with slickrock domes and knolls rising abruptly 450 feet above the mesa top in the north. Vegetation in the WSA consists primarily of pinyon-juniper woodland with several small, open sagebrush parks.

The average temperature at Canyonlands National Park is 53 degrees Farenheit (F), with an average low of 38 degrees F and an average high of 69 degrees F. The record low is -11 degrees F and the record high is 105 degrees F. Annual precipitation ranges from 12 to 14 inches over Bridger Jack Mesa. January, March, and August are the driest months. June, September, and October are the wettest months. Annual total snowfall averages 30 inches.

Specific Issues Identified in Scoping

General issues pertaining to the WSAs in the San Juan Resource Area are discussed in Volume I. Several concerns pertaining to the wilderness study process and/or the environmental analysis process were raised during scoping. These concerns are discussed in the Scoping section of Volume I rather than in individual analyses of WSAs. Specific issues and corresponding responses pertaining to the Bridger Jack Mesa WSA identified through formal public scoping (USDI, BLM, 1984) are listed below.

1. *Comment:* The area has oil and gas leases; how will these be treated?

Response: Under the No Action Alternative, all 5,290 acres would remain open to mineral location, to mineral (including oil and gas) leasing, and to mineral sale. Under the All Wilderness Alternative, all 5,290 acres of the WSA would be withdrawn from mineral location and closed to new mineral leasing and sale (refer to the Description of the Alternatives section of this document). Existing leases would remain in effect until their normal expiration date.

2. *Comment:* Values present should be protected by designation as wilderness rather than receive Outstanding Natural Area (ONA) status.

Response: Under the No Action Alternative, Bridger Jack Mesa would continue to be considered for possible identification as an ONA. Protection to resources would be somewhat similar to that identified for wilderness management; however, this would be a separate BLM planning action since only Congress can designate wilderness.

3. *Comment:* The WSA barely meets the size criteria.

Response: The size criterion for a WSA is 5,000 acres. Bridger Jack Mesa WSA includes 5,290 acres of public land.

4. *Comment:* Opportunities for solitude are limited due to the WSA's narrow configuration (1 by 10 miles), sparse vegetation, and imprints along the boundary.

Response: The WSA meets the outstanding solitude criteria, mostly due to its remote nature; however, with increased visitor use, outstanding opportunities for solitude could be reduced. If designated, visitation would be controlled through a specific Wilderness Man-

STATEWIDE
POCKET MAP
WSA
NO. 53
SEE VOL. I

agement Plan. Also, refer to the Affected Environment and Environmental Consequences, Wilderness Values section.

5. *Comment:* The isolated nature of the WSA gives it prime wilderness quality. The Site-Specific Analysis (SSA) conclusion that opportunities for solitude and recreation are less than outstanding is wrong.

Response: Refer to the previous response for comment on solitude. The mesa also meets the outstanding primitive and unconfined recreation criteria; however, in the narrower portions of the mesa, the opportunities are confined. Also, refer to the Affected Environment, Wilderness Values section.

6. *Comment:* Primitive recreation would be limited in the WSA.

Response: Refer to the previous response and the Affected Environment and Environmental Consequences, Wilderness Values sections.

7. *Comment:* The WSA is flat and lacks outstanding scenic values.

Response: The major feature of the WSA is Bridger Jack Mesa. The entire WSA is within an area evaluated as Class B scenery. Class B scenery combines some outstanding features and some features that are fairly common to the physiographic region. Refer to the Affected Environment, Visual Resources section.

8. *Comment:* The boundary for this WSA is a mystery. If the rules had been followed in the inventory, the Bridger Jack Mesa WSA would be bounded by the roads at the foot of the mesa. With the exception of a small uranium mine, the cliffs and talus slopes remain entirely natural.

Response: The boundaries of the WSA were established using criteria applied during the inventory phase of the wilderness study. In the judgment of BLM specialists, the boundaries are logical. The talus slopes and other lands surrounding the foot of the mesa are not considered to meet the inventory criteria.

9. *Comment:* Contrary to the SSA conclusion that recreational use would diminish wilderness values, since the area has only two access points, recreational use could be managed to prevent overuse.

Response: The increased use that the WSA could receive with designation is a management concern since specific actions (i.e., an active management program) would be needed to ensure continued outstanding opportunities for solitude and primitive and unconfined recreation. However, the conclusion reached in this Environmental Impact Statement (EIS) is that, due to limited access and control of visitation through a Wilderness Management Plan, visitation may not increase above present levels of use if the WSA is designated as wilderness.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated From Detailed Study

No alternatives were identified for this WSA during scoping other than those analyzed.

Alternatives Analyzed

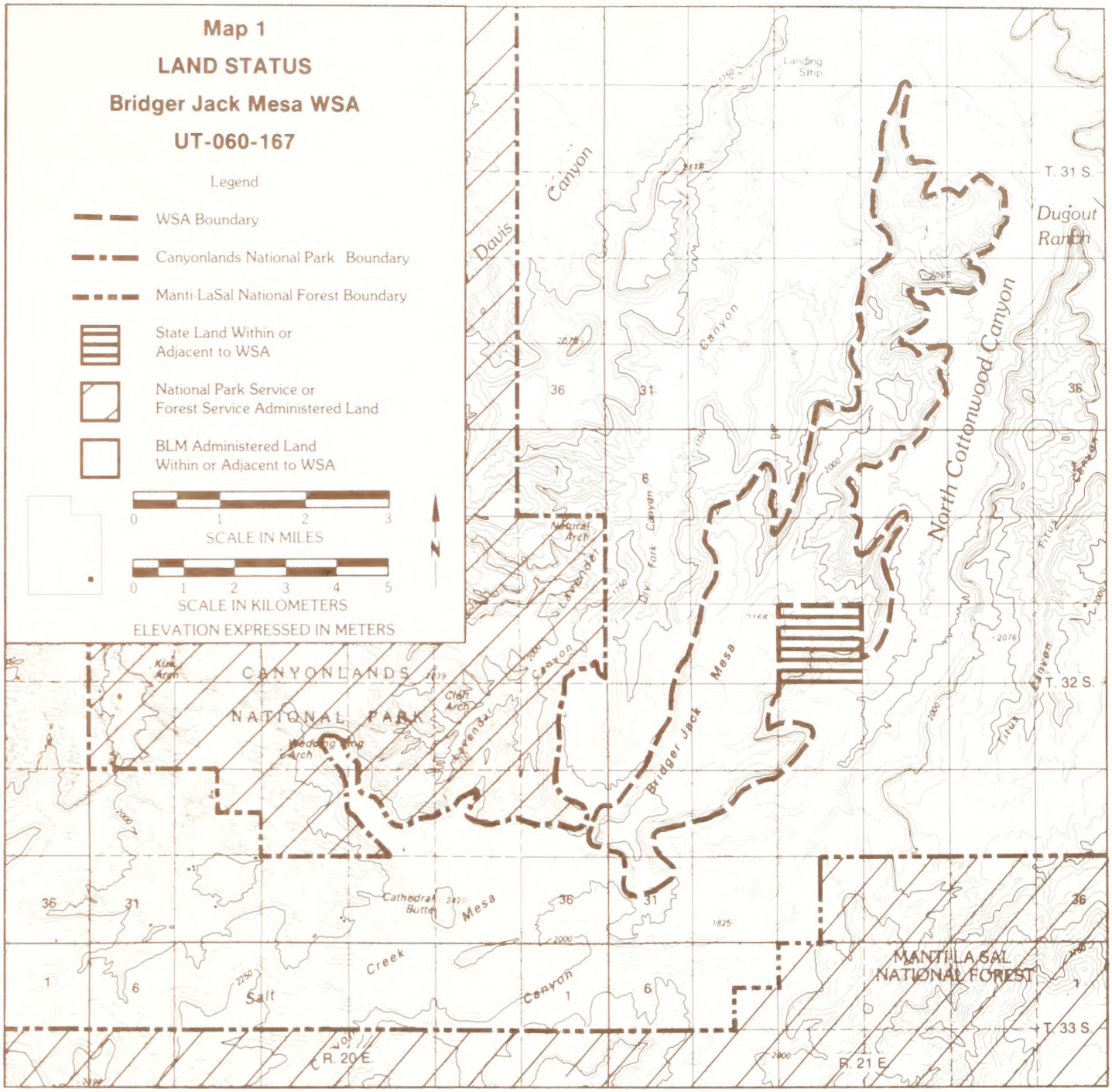
Two alternatives are analyzed for this WSA: (1) No Action; and (2) All Wilderness (5,290 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 5,290-acre Bridger Jack Mesa WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the Indian Creek-Dry Valley Management Framework Plan (MFP) (USDI, BLM, 1977) until that plan is superseded by the San Juan Resource Area Resource Management Plan (RMP) currently scheduled for completion in 1986. The one section of State land adjacent to the WSA (refer to Map 1) has not been identified in the MFP for special Federal acquisition through exchange or purchase. No State or private lands are located within the WSA.

The following are specific actions that would take place under this alternative:

- All 5,290 acres would remain open to mineral location, to mineral (including oil and gas) leasing, and to mineral sale. Development work, extraction, and patenting would be allowed on 20 existing mining claims (60 acres) and future mining claims. Development would be regulated by unnec-


Map 1
LAND STATUS
Bridger Jack Mesa WSA
UT-060-167
Legend
WSA Boundary
Canyonlands National Park Boundary
Manti-LaSal National Forest Boundary
State Land Within or Adjacent to WSA
National Park Service or Forest Service Administered Land
BLM Administered Land Within or Adjacent to WSA
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
CANYONLANDS
NATIONAL PARK
MANTI-LA SAL
NATIONAL FOREST
Bridger Jack Mesa
North Cottonwood Canyon
Davis Canyon
Dugout Ranch
Landing Strip
Cathedral Butte
Salt Creek
Lavender Canyon
Dry Fork Canyon
Natural Arch
Kirk Arch
Cleft Arch
Bedding Ring Arch
T. 31 S.
T. 32 S.
T. 33 S.
R. 20 E.
R. 21 E.
36
31
6
1

essary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases on 3,070 acres could be developed under leasing Category 1 (standard stipulations) while existing leases on 440 acres and future leases could be developed under Category 3 (no surface occupancy). Future leases would be issued under Category 3 on the entire WSA.

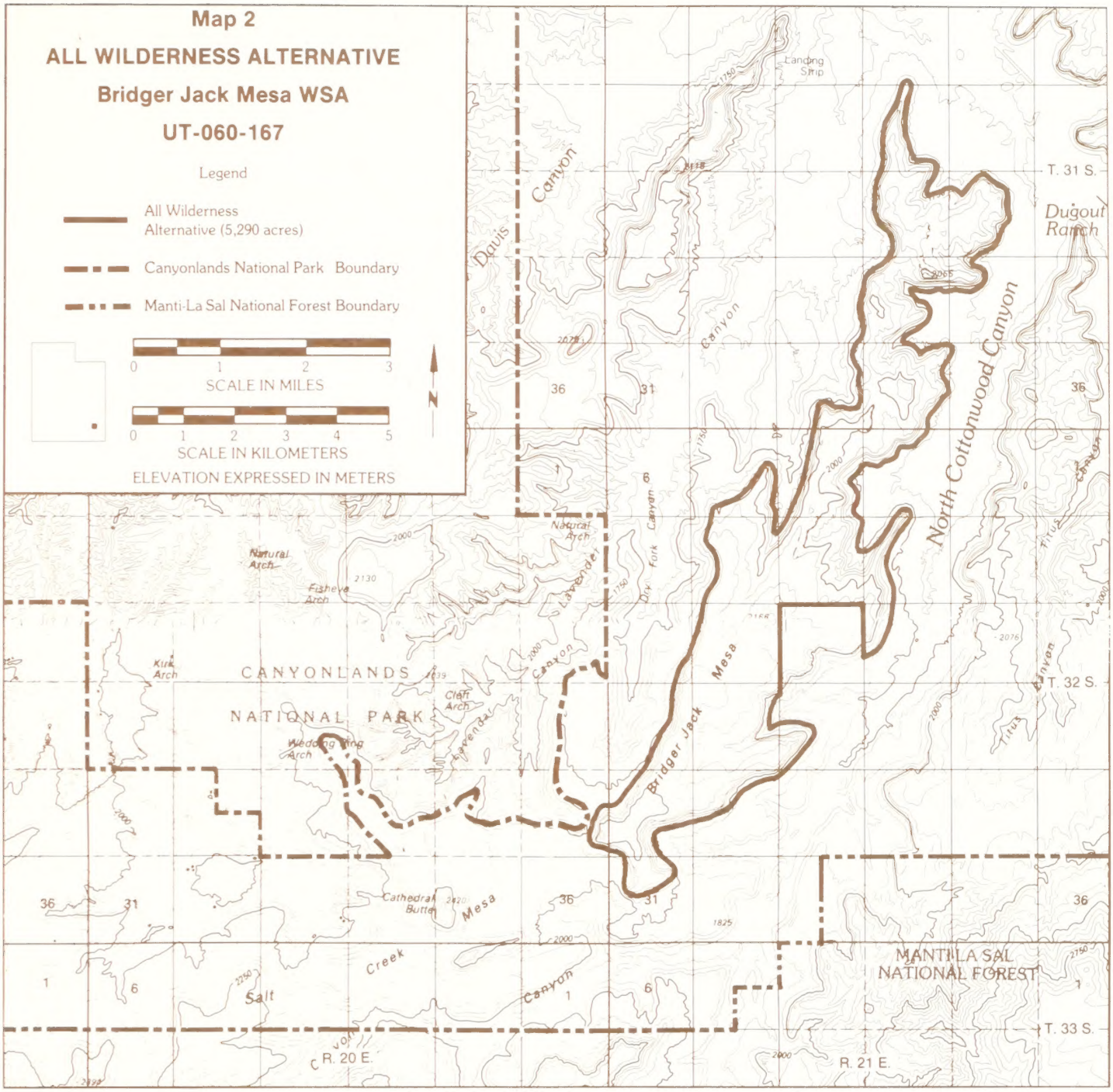
- Due to poor access, there is no present domestic livestock grazing use in the WSA. This nonuse would continue. There are no existing or planned livestock developments.
- Use, maintenance, and development of facilities and improvements for wildlife, water resources, etc., could be allowed if in conformance with the MFP. None exist or are currently planned for the area.
- The entire WSA acreage is, and likely would, remain inaccessible to off-road vehicle (ORV) use due to terrain limitations.
- The entire area would be open to woodland product harvest. There is no harvest of forest products (except perhaps occasional pine nut gathering) at the present time, nor is any planned.
- The entire 5,290-acre area would continue to be managed as Visual Resource Management (VRM) Class IV.
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.
- It is assumed that the No Action Alternative would include the continued consideration of Bridger Jack Mesa as a potential ONA. This would be intended to provide protection to vegetation, scenic, and cultural resources on the 5,290 acres, somewhat similar to that identified for wilderness management. Management as an ONA would be a separate BLM planning action that is not dependent on the wilderness review process; therefore, it is not further analyzed in this document.

ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under the All Wilderness Alternative, all 5,290 acres of the Bridger Jack Mesa WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. Upon designation, no acquisition of State land within or adjacent to the WSA (refer to Map 1) would be likely. The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 5,290 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the approximately 60 acres of 20 existing mining claims and any other claims located prior to wilderness designation that may be determined to be valid. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809), with consideration given to wilderness values. Existing oil and gas leases involving 3,510 acres of the WSA would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.
- The entire 5,290 acres would continue to be unused for domestic livestock grazing. Future livestock grazing would not be allowed.
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wil-*


Map 2
ALL WILDERNESS ALTERNATIVE
Bridger Jack Mesa WSA
UT-060-167
Legend
All Wilderness Alternative (5,290 acres)
Canyonlands National Park Boundary
Manti-La Sal National Forest Boundary
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
CANYONLANDS NATIONAL PARK
MANTI-LA SAL NATIONAL FOREST
Bridger Jack Mesa
North Cottonwood Canyon
Davis Canyon
Dugout Ranch
Landing Strip
Natural Arch
Fisher Arch
Kirk Arch
Cliff Arch
Wedding Ring Arch
Lavender Canyon
Dry Fork Canyon
Cathedral Butte
Salt Creek Canyon
T. 31 S.
T. 32 S.
T. 33 S.
R. 20 E.
R. 21 E.

derness Act (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are located in the Bridger Jack Mesa WSA, none are currently planned, and none would be expected in the future.

- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values, as long as criteria to protect wilderness values are met (refer to Appendix 1). No wildlife developments are existing or planned in this WSA.
- The entire 5,290-acre area would be closed to ORV use except for users with valid existing rights, if approved by BLM in accordance with 43 CFR provisions. There are no existing vehicular ways in the WSA, and there are no roads that form part of the boundary of the WSA.
- A specific Wilderness Management Plan would be developed that would govern use and protection of the 5,290-acre wilderness.
- Harvest of forest products would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products (except possibly a few pine nuts) at the present time and none is specifically planned.
- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Unless otherwise indicated information for this section was taken from BLM technical reports and file documents.

Air Quality

Bridger Jack Mesa is located in a Prevention of Significant Deterioration (PSD) Class II area as defined in the 1977 Clean Air Act, as amended. However, a Class I area (Canyonlands National Park) is less than 1 mile from Bridger Jack Mesa. Only very low levels of air quality degradation are allowed in Class I areas. The background visibility range for Bridger Jack Mesa is estimated to average 100 to 132 miles during the summer (Aerocomp, Inc., 1984). Generally the average visibility is greater in the winter than in the summer. Air quality is good throughout the WSA.

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
BRIDGER JACK MESA WSA

Resource	Alternatives	
	No Action	All Wilderness (5,290 Acres) (Proposed Action)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil, 18 billion cubic feet of natural gas, 500 tons of uranium oxide, 1 million tons of potash, and 100,000 tons of manganese.	Oil, gas, and potash likely would not be recovered. Assuming a worst-case analysis, uranium and manganese recovery would also be foregone. Due to the low likelihood of recovery of these mineral resources, however, the loss of development opportunity would not be significant.
Wildlife	About 4.2 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.
Visual Resources	The quality of visual resources could be impaired on up to 223 acres.	Visual quality could be impaired on up to 21 acres.
Recreation	The WSA is closed to ORV use. Primitive recreational use could increase from the present 100 visitor days per year to 150 over the next 20 years. However, due to access constraints, future recreational use may remain at present levels. Up to 223 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA would be closed to ORV use. This closure would not reduce ORV use because the lack of access to the WSA prevents ORV use at present. Access limitations could also cause future primitive recreational use to remain at present levels following wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 223 acres (4.2 percent of the WSA).	Wilderness values would be protected, except on up to 21 acres (0.4 percent of the WSA) which may be disturbed by development of valid mineral rights.
Land Use Plans and Controls	This alternative would be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the current BLM Indian Creek–Dry Valley MFP.	This alternative would not be consistent with San Juan County's concept of multiple use. It would not conflict with State plans. Designation would constitute amendment of the BLM Indian Creek–Dry Valley MFP or the forthcoming San Juan RMP.
Socio-economics	Annual local sales of less than $2,410 and Federal revenues of up to $10,530 would continue. An additional $5,340 per year in Federal revenues could be derived from leasing of presently unleased areas.	Annual local sales of less than $2,410 would continue. Federal revenues of up to $15,870 from mineral leasing would be foregone. There are no Federal revenues from livestock grazing. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.

Geology

Bridger Jack Mesa WSA is within the Canyonlands section of the Colorado Plateau Physiographic Province. This section is characterized by bare rock surfaces, plateaus, and steep-walled canyons. This long, narrow mesa gradually dips to the north and ranges in elevation from 6,000 to 6,200 feet above sea level and 500 to 1,000 feet above the surrounding canyon bottoms. Topographic relief is limited in the southern half of the WSA, while the northern portion has greater relief with sandstone domes and knolls rising up to 450 feet above the mesa top.

Geologic formations exposed in the WSA are Triassic in age and consist of, in ascending order, the Moenkopi Formation, the Chinle Formation, and the Glen Canyon Group (which may include some Jurassic rocks). The Glen Canyon Group consists of, in ascending order, Wingate Sandstone, Kayenta Formation, and Navajo Sandstone. Both the base and top are bounded by regional unconformities. The unconformity at the base separates the Triassic Moenkopi Formation from lower Permian rocks (Cutler Formation). The unconformity at the top is an erosion surface marked by chert pebbles and separates the Triassic Navajo from the overlying Jurassic Glen Canyon Group.

Bridger Jack Mesa lies along the east limb of the Monument Upwarp, a major north-trending structural division of the Colorado Plateau. The upwarp is 100 miles long, 50 miles wide, and trends north 10 degrees east. This broad upwarp is asymmetrical; dips on the west average 2 degrees, and dips on the east are approximately 50 degrees. No large structural features have been mapped within the unit.

Soils

Most of this WSA consists of shallow loamy soils and rock outcrop (refer to Table 2). There are small areas of deep and very deep loamy soils on the top of the mesa generally in concave slope positions. These are positions where alluvium and eolian sediments have accumulated.

Under present conditions, most soil losses from water erosion occur on the shallow soils rimming the mesa and on the top of the mesa near expanses of rock outcrop. The average rate of soil loss at present is estimated to be about 0.6 cubic yards/acre/year (refer to Table 3).

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Estimated Rate of Erosion (cubic yards/acre/year) Bare Soil Surface
Rock Outcrop	40	2,116	0	0
Shallow loamy soils on sloping structural benches	20	1,058	1	5
Moderatly deep to very deep loamy and stony soils on moderatly steep canyon sides	20	1,058	1	10
Shallow to deep stony soils on steep canyon sides	20	1,058	1	10
Totals	100	5,290		

Source: Hansen, 1985.

Vegetation

Existing vegetation of the WSA is primarily pinyon-juniper forest with small sagebrush parks (refer to Table 4).

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Pinyon-juniper	4,760	90
Sagebrush	530	10
Totals	5,290	100

Source: USDI, BLM, 1977.

The pinyon-juniper type consists of mature 8- to 10-foot-high trees with very little understory. In some areas of deeper soil the understory is a mixture of sage, blue grama, and muttongrass.

There is no riparian habitat in the WSA.

The sagebrush type has an understory of Indian ricegrass, blue grama, western wheatgrass, needle-and-thread grass, and winterfat.

Narrow bands of slickrock are found along the rim of the mesa. Vegetation along the slickrock is

Table 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions			Annual Soil Loss if Disturbed		
		Percent of Area	Acres	Cubic Yards	Percent of Area	Acres	Cubic Yards
Very High	20.0	0	0	0	0	0	0
High	10.0	0	0	0	40	2,116	21,160
Medium	5.0	0	0	0	20	1,058	5,290
Low	1.0	60	3,174	3,174	0	0	0
Very Low	0.1	0	0	0	0	0	0
None	0.0	40	2,116	0	40	2,116	0
Totals		100	5,290	3,174[1]	100	5,290	26,450[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.6 under present conditions; 5.0 if disturbed.

sparse pinyon-juniper, serviceberry, and mountain mahogany.

During the 1950s and 1960s, when wintering deer populations were high, the sagebrush was severely browsed. During this time, plant succession favored the propagation of cool-season bunchgrasses such as needle-and-thread grass.

At the present time, through natural plant succession, there is an excellent diversity and composition of grasses and shrubs in the parklands. Those areas that are no longer grazed by livestock provide good comparisons for grazed ecosystems.

There are no threatened, endangered, or sensitive plant species known to occur in the WSA.

The WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) type of the WSA is juniper-pinyon woodland. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

Water Resources

Water is a limited resource within the Bridger Jack Mesa WSA. There are no water wells, springs, or reservoirs on the mesa top. After rainfall or snowmelt, water is retained for short periods in natural rock tanks.

At one time, there were two reservoirs within this WSA. These reservoir sites have filled in and are no longer visible.

Mineral and Energy Resources

The BLM, in cooperation with the U.S. Department of Energy, had each WSA assessed for its energy and mineral resources by Science Applications, Inc. (SAI, 1982). Refer to Appendix 5 for a description of the SAI rating system.

An overall importance rating (OIR) of 2- was assigned to the Bridger Jack Mesa WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. Shades of importance are indicated by + or -. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource

importance of the WSA. This applies to 75 to 100 percent of the tract evaluated by SAI.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

Refer to Table 5 for the mineral and energy resource rating summary for the WSA.

TABLE 5
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f2	c1	Less than 10 million barrels of oil; less than 60 billion cubic feet of gas
Copper	f2	c1	Less than 50,000 tons contained copper
Uranium/ Vanadium	f2	c3	Less than 500 tons of uranium oxide
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f1	c4	None
Manganese	f2	c1	Less than 100,000 tons of 40-percent concentration
Potash	f2	c2	Less than 1 million tons

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. The WSA could contain deposits of copper, manganese, and vanadium that are currently listed as strategic and critical materials (Federal Emergency Management Agency, 1983). Although listed as strategic, copper is relatively common. Supplies currently exceed domestic demand.

No active exploration or development of mineral resources now occurs in the Bridger Jack Mesa WSA.

LEASABLE MINERALS

Due to unfavorable geologic conditions, it has been determined that no coal, geothermal, or other leasable resources are present in this WSA. No leases are located in this WSA for these minerals.

Oil and Gas

A few exploratory wells have been drilled in the vicinity of the WSA but none directly on the mesa.

The oil and gas favorability of the WSA is considered low because of deep erosion that probably resulted in the loss of hydrocarbons and reservoir pressure. Small fields may nevertheless exist in stratigraphic and structural traps in Pennsylvanian and, perhaps, in Mississippian rocks. On this basis, the WSA has been assigned a favorability rating of f2. Approximately 10 million barrels of oil in-place and 60 billion cubic feet of natural gas may occur within the WSA, with 3 million barrels of oil and 18 billion cubic feet of natural gas estimated to be recoverable (refer to Appendix 6 for recoverability estimates). The degree of certainty that oil and gas resources exist in this area is relatively low because of the sparsity of wells.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness

designation would not affect the termination of existing leases.

The WSA contains three pre-FLPMA leases (3,070 acres) and three post-FLPMA leases (440 acres). These post-FLPMA leases contain no surface occupancy stipulations; however, the pre-FLPMA leases pre-date the establishment of leasing categories and do not contain this stipulation. Presently the entire WSA is in leasing Category 3 (no surface occupancy) that would apply to any new leases.

Potash

The only known potash-bearing unit in the vicinity is the Paradox Formation of Pennsylvanian Age. This formation originated in a slowly subsiding, northwest-trending basin called the Paradox Basin that existed in the Moab region about 300 million years ago. The potash deposits in the Paradox Formation are thickest and nearest to the surface along a series of northwest-trending anticlines within a structural zone approximately 100 miles long and 30 miles wide in Utah and Colorado. The Paradox fold and fault belt lie along the border of the thick potash-bearing zones in the Paradox Formation.

The WSA has been assigned a potash rating of f2, which means that geologic conditions are marginally favorable. If deposits occur, they would generally contain less than 1 million tons of potash. Potash could underlie at considerable depth of all 5,290 acres of the WSA. No leases for potash occur in the WSA. Potash development is not likely in the WSA as other proven reserves are present elsewhere in the region.

LOCATABLE MINERALS

BLM records show that 20 mining claims (60 acres) have been located within the WSA.

Locatable minerals such as lead, gold, zinc, and silver are essentially absent from the sedimentary units of the Colorado Plateau (including Bridger Jack Mesa) except areas of igneous intrusion.

Uranium and Associated Minerals

There is no evidence of active or past mining within the WSA. There are, however, several small inactive uranium mines located immediately northwest and northeast of the unit. The small uranium mines located just outside the boundaries of the unit are within White Canyon Mining District, which covers a crescent-shaped area from the Colorado River on the southwest to the Dugout Ranch on the northeast southward to White Canyon.

The WSA has geologic conditions favorable for the occurrence of small deposits of uranium, and the unit is assigned a low favorability rating for uranium and vanadium. Because numerous uranium deposits occur nearby, the certainty that uranium and vanadium could occur somewhere in the WSA is relatively high. It is significant to note, however, that no mining has taken place from this unit even during times of high ore prices and strong market conditions. The uranium deposits may underlie all 5,290 acres of the WSA, but in most cases they crop out outside of the WSA on the flanks of Bridger Jack Mesa, resulting in mine adits and dumps being outside the WSA.

Uranium mines in the Chinle Formation surrounding the WSA all contain some copper. The amount, however, is small and copper can be recovered only as a by-product of uranium production; therefore, copper is assigned a low favorability.

Manganese

The WSA lies south of the Little Grand Management District and southwest of the widely scattered deposits of manganese that occur throughout this part of east-central Utah. The chief host rocks for manganese in this region (the Morrison and Summerville Formations) have been eroded from the tract. The less favorable Chinle Formation occurs at shallow depths throughout most of the tract and, on this basis, manganese has been assigned a low favorability. These deposits may underlie all 5,290 acres in the WSA.

SALABLE MINERALS

There are no salable minerals of commercial grade within the WSA.

Wildlife

The pinyon-juniper woodland communities on Bridger Jack Mesa support a variety of animal species. The Indian Creek-Dry Valley Unit Resource Analysis provides a complete species list. The Beef Basin Habitat Management Plan covers the WSA, but no wildlife habitat improvements have been identified. No threatened or endangered species have been identified in this WSA by the Fish and Wildlife Service (FWS). No critical acres of habitat for threatened and endangered species have been identified.

Bridger Jack Mesa is utilized by wintering mule deer and 2,700 acres are classified as crucial deer winter range. Due to the lack of water sources, the majority of the use is from November through

March. The WSA is within Deer Herd Unit 31B. This herd unit has been closed to hunting during the past several seasons because of extremely low populations and productivity.

Bobcats and coyotes are found on the mesa. Cottontail rabbits, pinyon mice, and assorted bats (mainly western pipistrel) are the most common mammals.

Golden eagle, a sensitive species, nests on Bridger Jack Mesa. Red-tailed hawk, American kestrel, Cooper's hawk, common raven, pinyon jay, plain titmice, and rock wren are found within the WSA. Juncos are the most common wintering bird species. Mourning dove probably nest on the mesa. Chukar, an exotic gamebird introduced from Asia, also utilize the Bridger Jack Mesa WSA. The side-blotched lizard and the northern plateau lizard are the most common reptiles on Bridger Jack Mesa.

Forest Resources

There are 4,760 acres of pinyon-juniper woodland on Bridger Jack Mesa. These are low quality sites (20 cubic feet usable wood per acre) and are considered nonproductive forest land. There would be less than 740 cords of firewood in the WSA. At the present time, pulp and papermaking opportunities are low. Due to the lack of vehicle access to the mesa, firewood is not gathered from the mesa. Pine nuts may be gathered by occasional recreationists.

Livestock and Wild Horses/Burros

There is no livestock grazing on Bridger Jack Mesa at the present time. Horses grazed the mesa during the winters through 1956. Cattle were also grazed on the mesa from the 1920s to the mid-1940s. The Indian Creek Allotment Management Plan excluded livestock grazing from the mesa in 1970. Since then, there has been no authorized livestock grazing on Bridger Jack due to poor access.

There are no usable range developments within the WSA and none are planned. No agricultural activity takes place within the WSA. There is no access route for vehicles or farm equipment to the mesa top. Limited water availability and lack of access restrict feasibility for potential agricultural development.

There are no wild horses or burros in the WSA.

Visual Resources

The major feature of the WSA is Bridger Jack Mesa, a long, narrow mesa top (approximately 10 miles long and 1 mile wide) running southwest-northeast. The mesa top is relatively flat in the south, with slickrock domes and knolls rising abruptly 450 feet above the mesa top in the north. Colors are light pinks and grays to dark browns and reds. Textures are fine to coarse.

Vegetation in the WSA consists primarily of pinyon-juniper woodland with several small, open sagebrush parks. Colors are dark greens and gray-greens. Textures are coarse to medium.

The entire WSA is within an area evaluated as Class B scenery (5,290 acres). Class B scenery combines some outstanding features and some features that are fairly common to the physiographic region.

Bridger Jack Mesa is located in a low sensitivity area. The WSA is in the seldom-seen distance zone, which is the area that is seen from low-use transportation routes. The entire WSA is located in a VRM Class IV area. Refer to Appendix 7 for a description of BLM's VRM rating system.

Cultural Resources

No significant archaeological work has been conducted on Bridger Jack Mesa. Little is known about the cultural resources of the general area north of the Abajo Mountains, except that site densities are lower here than in most of San Juan County and that this locale is transitionally situated between Fremont and Anasazi cultural groups. Inventory to date in southeast Utah has led to the recognition of the broad cultural periods recognized for the region today.

Although site and survey information points to exclusive occupation of the Bridger Jack Mesa area by the Anasazi, it is possible and likely that Archaic (Basketmaker I) and Ute/Navajo peoples also made use of this locale. Human occupation on Bridger Jack Mesa has been episodical and discontinuous.

Because of the inaccessibility of Bridger Jack Mesa, this WSA potentially contains numerous pristine cultural resources. A literature search revealed three recorded sites, two of unknown character and one consisting of a cist. It is probable that both farming and hunting occurred in this area, with small pueblos and lithic scatters representing such activities. The cultural significance of the Bridger Jack Mesa WSA lies in the potential

for answering settlement and subsistence questions in this little understood area.

There are no existing National Register sites and/or nominations in the WSA. However, based on estimates from similar settings in the area, it could be expected that 125 sites would be located in the WSA, of which 80 could be National Register eligible.

In the 1920s Mildruff Young (foreman for the S S Cattle Company) constructed two trails onto the mesa and developed three reservoirs to facilitate cattle grazing. The plow and slip used to construct the projects were left on the mesa and could be considered of historical significance.

Recreation

Information on recreational activities and visitation is not available for the WSA. Local residents of San Juan County have indicated recreational uses of the unit include hunting, photography, backpacking, and sightseeing. During the 5 years prior to closing the Utah Division of Wildlife Resources (UDWR) Deer Herd Unit 31B, there were probably only 2 or 3 days of hunter use on Bridger Jack. Total recreation use would amount to less than 100 visitor days annually. All of the use is attributed to primitive activities (nonmotorized) and none is related to commercial outfitting. Three deterrents to heavy use of the unit are difficult access, low diversity of terrain, and a lack of permanent water sources. Extensive deterioration of livestock trails allows visitors access to the top by foot travel only. Once on top, the area is a rolling, pinyon-juniper mesa top; no significant topographical, vegetation, or cultural features are present that would draw a great number of visitors.

The topography of the mesa prevents both current and potential ORV use.

Perhaps the main attraction of the area is the extreme remoteness of the mesa top and its associated vistas.

Wilderness Values

SIZE

The 5,290 acres comprising the WSA are sufficient to allow wilderness values to be present and to meet the minimum size criteria for lands under wilderness review.

NATURALNESS

Bridger Jack Mesa is still in a relatively natural condition. There are no functional range developments on the mesa. The two trails constructed for livestock have deteriorated from lack of maintenance. At least three reservoirs were constructed on the mesa with a plow and slip. One of these reservoirs was on the State section adjacent to the WSA. These reservoirs have since filled in, revegetated, and now blend into the environment. They are not noticeable from the air. The slip and plow were left on the mesa. Neither implement is noticeable unless it is searched out.

Mining claims have been staked and annual claim assessment work has been completed in portions of the WSA, but there are no major imprints within the WSA.

The WSA is natural on all 5,290 acres.

SOLITUDE

At the present time, with only limited visitor use, Bridger Jack Mesa WSA provides outstanding opportunities for solitude.

The narrow elongated configuration of the mesa would tend to concentrate any increased recreational activities. In at least four areas, the mesa is less than 0.5-mile wide and limits opportunities. The rolling topography and rock outcrops obscure sights and sounds of others in about 50 percent of the WSA. The pinyon-juniper woodland provides added visual screening and would help dissipate but not eliminate sights and sounds from other groups.

Outside sights and sounds are apparent. The paved road to Canyonlands National Park is easily seen from the rim of the mesa, and traffic can be heard from the two northern points of the mesa. The Dugout Ranch hay fields and roads in Lavender and North Cottonwood Canyons are also readily observed from the WSA. Airplanes are usually observed in this area. From Bridger Jack Mesa, a visitor has excellent views of the Six-Shooter Peaks, Lavender Mesa, Harts Point, and Canyonlands National Park.

The mesa top offers opportunities for seclusion. The narrow necks and offsite intrusions limit opportunities to find seclusion in the northern half of the WSA; however, all 5,290 acres currently meet the outstanding solitude criteria.

PRIMITIVE AND UNCONFINED RECREATION

At the present time, Bridger Jack Mesa WSA provides opportunities for primitive recreational experiences due to its difficult access and limited visitor use. However, the narrow necks of the mesa would tend to concentrate user activities.

The elongated mesa top itself confines all recreation to a narrow band (especially in the northern portion).

Overall, the 5,290 acres in the WSA do meet the criterion for outstanding primitive and unconfined recreation under wilderness review.

SPECIAL FEATURES

The view from Bridger Jack Mesa is its major asset, enhancing the recreational experience. Because of the inaccessibility of Bridger Jack Mesa, this WSA potentially contains up to 125 cultural resource sites.

Land Use Plans and Controls

There are no private in-holdings within the Bridger Jack Mesa WSA. The area is composed entirely of public land.

All lands contiguous to the WSA (except Section 16, which is State land) are public lands administered by BLM. The private lands of the Dugout Ranch are generally within 0.25 mile of the eastern boundary of the mesa.

Access is gained into the area by U.S. Highway 191 and State Highway 211. A county road leaves State Highway 211 and crosses private land for approximately 0.50 mile. The county road traverses North Cottonwood Creek Basin and Salt Creek Mesa.

There is no vehicle access to Bridger Jack Mesa. During the 1920s through the 1940s, two livestock trails were maintained to Bridger Jack. The main trail goes up the southeast corner of the mesa. Another steeper trail goes up in Section 27.

The southwest end of the WSA (Section 25) is located within 0.25 mile of the southeast boundary of Canyonlands National Park and the Needles Proposed Wilderness. No contiguous lands are currently under consideration for wilderness by any agency.

The BLM Indian Creek-Dry Valley MFP was completed in 1977. The WSA is covered by the Beef Basin Habitat Management Plan and the Indian Creek Allotment Management Plan which recommended an ONA designation. The Indian Creek-Dry Valley MFP will be replaced by the San Juan RMP scheduled for completion in 1986.

The *San Juan County Master Plan* (Planning and Research Associates, 1967) zones the WSA as open range/forest lands. The Master Plan predates wilderness considerations. However, the San Juan County Commission (1980) has pointed out that "nearly 20 percent" of the land in the county "has already been set aside for protection and preservation" and that the remainder of the county is "designated multiple use by our land use planning and zoning ordinance . . . the San Juan County Commission opposes any wilderness areas being legislatively or administratively designated in the County."

Socioeconomics

DEMOGRAPHICS

The WSA lies in north-central San Juan County. The nearest community is Monticello. The character of the county can be summarized as rural and sparsely populated. The socioeconomic effects of designation would be confined mostly to San Juan County.

San Juan County had a 1982 population of 12,700, less than 1 percent of the State population (University of Utah, Bureau of Economic and Business Research, 1982). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers. Monticello, the county seat, had a 1980 population of 1,930 and Blanding, about 20 miles south, had a 1980 population of 3,120 (U.S. Department of Commerce [USDC], Bureau of the Census, 1981).

San Juan County is one of the largest counties in Utah, comprising 7,885 square miles (about the size of New Jersey). About 85 percent of the county is owned by the Federal Government, 6 percent by the State of Utah, and 8 percent by private land owners (University of Utah, Bureau of Economic and Business Research, 1982). The southern portion of the county is included in the Navajo Indian Reservation.

EMPLOYMENT

Even though local employment in the mining industry decreased by 20 percent between 1980 and 1982 due to a downturn in local uranium mining and milling, it still remains the largest local private employer (Utah Department of Employment Security, 1983).

INCOME AND REVENUES

Recent statistics, as shown on Table 6, indicate that mining directly accounts for half of the income and over 32 percent of the employment in the county (USDC, Bureau of Economic Analysis, 1983). Because the mines and mine employees both purchase products locally, mining's total local importance is even greater. Government and tourism are San Juan County's next most

TABLE 6
1981 Employment and Income
San Juan County, Utah

Type/Source	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance and Real Estate	1	1
Services	8	11
Other	-	-
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	96
Unemployment (1st Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

Note: Because of rounding, numbers are additive. Employment percent figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services.

important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are on welfare and are, therefore, not included in unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

Activities in the WSA that could be of some local economic consequence include mineral exploration and dispersed nonmotorized recreation, as summarized on Table 7.

The WSA has 20 mining claims that are current in assessment. Regulations require a $100 annual expenditure for labor and improvements per claim to keep the claim current. Some of these expenditures are made within the local economy.

Except for some trespass use in the early 1970s, the WSA has not been a source of livestock forage for over 20 years. Woodland harvest is essentially nonexistent and has not produced income from the WSA.

TABLE 7
Local Sales and Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	$10,530
Mining Claim Assessment	$2,000	None
Mineral Production	None	None
Livestock Grazing	None	None
Recreational Use	Less than $410	None
Total	Less than $2,410	Up to $10,530

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total local sales that would be generated by these expenditures.

Historical hunting pressure in the WSA has been low, and currently no hunting use exists. The WSA's nonmotorized recreational use is low and related local expenditures are well distributed. These expenditures are insignificant to both the local economy and individual businesses. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for the Bridger Jack Mesa WSA is estimated as about 100 visitor days per year. Only a portion of the $4,100 expenditures for recreational use of the WSA contribute to the local economy of San Juan County.

The WSA generates revenues to the Federal Treasury from only one source: mineral leasing. Within the WSA, about 3,510 acres are currently leased for oil and gas. At up to $3 per acre, this generates up to $10,530 annually. Half of this, or about $5,265, is allocated back to the State of Utah. The State then reallocates these revenues to various funds, the majority of which are related to energy development.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines For All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section of this document.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without control for wilderness protection. The degree of future development is unknown but would probably be relatively low due to the WSA's difficult access and low resource potential. The following is a worst-case analysis, based on the assumption that minerals would be developed sometime in the future and would result in the following disturbance: oil and gas, 160 acres; potash, 42 acres; manganese, 1 acre; and uranium 20 acres. (Appendix 10 lists surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed as a PSD Class II area and some degradation in air quality could occur; however, the likelihood of this occurring in the area in the near future is thought to be low since a Class I area (Canyonlands National Park) is only 1 mile from Bridger Jack Mesa. Disturbance of 223 acres (4.2 percent of the WSA) would result in only minor increases in fugitive dust emissions.

GEOLOGY

No impacts to geology are expected because surface disturbance associated with locatable minerals (i.e., manganese and uranium), oil and gas, and potash exploration and development activities would probably not exceed 223 acres. This would not significantly affect geology.

SOILS

It is estimated that up to 223 acres of soil would be disturbed by mineral and energy exploration and development. The average rate of soil loss at present is estimated to be about 0.6 cubic yards/acre/year. Soil loss on the 223 acres would increase from 134 cubic yards/year to 1,115 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 981 cubic yards (31 percent) over current annual soil loss. However, because of the small size of mineral deposits, economic considerations, and the extremely difficult access to the mesa top, little surface disturbance is likely to result within the WSA for either exploration or annual assessment work on claims.

VEGETATION

The anticipated maximum of 223 acres disturbed would not significantly impact the WSA's vegetation. The 4,760 acres of pinyon-juniper and 530 acres of sagebrush vegetation type are not expected to be significantly impacted. There are no threatened or endangered plant species known to exist within the WSA.

WATER RESOURCES

Since precipitation is low, all surface waters are ephemeral, and water is retained only for short periods in natural rock tanks within the WSA, no significant sedimentation or change in total dissolved solids (TDS) is expected to occur from the 1,115 cubic yards of annual soil loss from surface disturbance. Opportunities for any actions related to water sources are very limited.

Mineral exploration and development in the area

is generally confined at or near the surface or with widely spaced wells and would not significantly impact ground water.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

The potential for up to 3 million barrels of oil and up to 18 billion cubic feet of natural gas estimated recoverable exists within the WSA. These oil and gas resources could be explored and developed, subject to Category 1 stipulations on 3,070 acres and Category 3 (no surface occupancy) on 440 acres. However, due to the small size of these potential deposits, no development is expected under this alternative. Following expiration of existing leases, leases would be issued under a no surface occupancy stipulation and no surface disturbance would occur.

Potash

The potential for up to 1 million tons of potash could occur in the Bridger Jack Mesa WSA. No leases have been issued for this material, but leasing could be carried out in the future without wilderness considerations. Considering the difficult access and the large potential for potash elsewhere in the region, it is concluded that extraction of potash within the WSA is unlikely.

Locatable Minerals

Locatable mineral development could occur within the WSA. The entire WSA would remain open to mining claim location. The potential deposit of up to 500 tons of uranium oxide and up to 100,000 tons of manganese could be developed. However, the likelihood of development is thought to be minimal because of economic considerations (e.g., transportation, low potential, etc.).

WILDLIFE

Under this alternative, the 2,700 acres of crucial winter deer habitat could be impacted by mineral and energy exploration and development. Disturbance of an estimated 223 acres (4.2 percent of the WSA) through mineral and energy development and exploration would disrupt wildlife. Mule deer, bobcats, cottontail rabbits, and mobile nongame animals would be dispersed from the disturbed area for the lifetime of these activities. Less mobile wildlife would either perish or coexist with these disturbances at smaller population levels. Golden eagle, a sensitive species, would also avoid the disturbed area. The golden eagle is the only sensitive species found within or near the WSA. Before authorizing surface-disturbing activities (223 acres potential), BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy. If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken, it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be preserved under the No Action Alternative.

FOREST RESOURCES

Forest products could be harvested for private or commercial uses; however, this would not be a substantial beneficial impact since little use (except by occasional campers or hikers) is currently made of this resource in the WSA and there are numerous other sources for wood more conveniently located. Less than 740 cords of wood would be available for use. Since minimal surface-disturbing activities are anticipated, no harvest or loss of forest resources is expected.

LIVESTOCK

No grazing presently occurs in the WSA. It is expected that there would be no changes in livestock management.

VISUAL RESOURCES

Visual values in areas affected by the estimated 223 acres of surface disturbance from mineral and energy exploration and development would be degraded; however, VRM Class IV management objectives would probably be met. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. Even after rehabilitation, some permanent localized degradation would be expected. If surface disturbance such as access routes and drill pads is located throughout the area (worst-case analysis), visual quality could be significantly reduced in the WSA as a whole.

CULTURAL RESOURCES

Disturbance of 223 acres by mineral and energy exploration and development under this alternative could impact three recorded and 125 potential sites (80 of which could potentially be eligible for the National Register) through loss and vandalism due to increased access. However, inven-

tories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would mitigate impacts. Inadvertent loss or damage could occur in the disturbed area. The overall effect on cultural resources is expected to be minimal. With improved access, vandalism could become a problem and would increase in proportion to the general population increase.

RECREATION

The quality of a user's primitive recreational experience would be reduced by surface-disturbing activities. If disturbance is located throughout the WSA (worst-case analysis), primitive recreational opportunities could be lost in the area altogether. However, access routes created for mineral and energy exploration and development would improve access into the area for non-primitive recreation. The future increase in recreational use of the WSA is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate, overall recreational use, most of which would be primitive (nonmotorized), is expected to increase from less than 100 current visitor days per year up to 150 at the end of 20 years. However, it is likely that, due to the access constraints, future use may remain at approximately the same level (less than 100 visitor days per year). There would be little or no opportunity for commercial outfitting.

WILDERNESS VALUES

None of the area would be designated wilderness, and management would be under the existing Indian Creek-Dry Valley MFP until that plan is superseded by the San Juan RMP. Wilderness values in this WSA (i.e., naturalness, opportunities for solitude and primitive recreation, and special features) could be lost or diminished in affected areas. However, the impacts to these values probably would not be significant due to the limited surface disturbance anticipated. Due to the topography, motorized access probably would continue to be limited.

Under this alternative, wilderness characteristics in the WSA would be protected by limitations placed on potential surface-disturbing activities. However, under this alternative, 223 acres of mineral and energy exploration and development are possible. The related surface disturbance would result in a significant loss of naturalness and outstanding opportunities for solitude and primitive, unconfined recreation. The potential exists for the 5,290 acres considered natural to be lost due to surface-disturbing activities. The potential for mineral development and related disturbance is low in this WSA.

LAND USE PLANS AND CONTROLS

This alternative would be consistent with the *San Juan County Master Plan* which designates multiple use of lands in the county. The No Action Alternative is based on implementation of the current BLM Indian Creek-Dry Valley MFP and the forthcoming San Juan RMP and is, therefore, in conformance with these plans. This alternative would be consistent with State of Utah plans and policies that emphasize economic return.

SOCIOECONOMICS

Under this alternative, no changes are expected in existing patterns and trends of population, employment, and local income distributions. Economic development of resources in the WSA would not be affected.

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the oil and gas, manganese, potash, and uranium, etc., in the WSA were developed, it would lead to an increase in employment and income for San Juan County. However, the probability of economic development of minerals within the WSA is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because there is no present grazing use, and the ability to build new range improvements would remain as at present. There are no proposed developments that would increase AUMs of new allocated forage that could lead to increased livestock sales and ranchers' returns to labor and investments.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase only 50 visitor days per year over the next 20 years and overall recreation-related expenditures average only $4.10 per visitor day (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA would likely not be significant to the local economy.

Federal and State revenues would not be reduced by this alternative. Generation of $10,530 per year in Federal oil and gas lease revenues within the WSA would continue with existing leases, and these leases could be reissued in the future. There are 1,780 acres in the WSA open to oil and gas leases that are currently not leased. If leased, they would bring up to $5,340 additional Federal lease fee revenues per year in addition to new royalties from any lease production. Half of these monies would be allocated to the State, a portion of which could reach the local economy.

In conclusion, the potential for economic benefits related to development of commercial mineral deposits in the WSA would remain. However, prospects are marginal, and there is limited possibility that resources would be affected. Overall, the local economic impact would be considered insignificant.

All Wilderness Alternative (5,290 Acres) (Proposed Action)

As identified in the Description of the Alternatives section, the major changes that could occur in the 5,290-acre area would be related to its withdrawal from mineral location and closure to new mineral leasing and sale. The entire area would be placed in leasing Category 4 (closed to leasing). The WSA would be managed under VRM Class I.

For the following analysis it is assumed that the existing mining claims would eventually be explored and developed, causing an estimated 21 acres of disturbance within the WSA. It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing of oil, gas, and potash would not be allowed. (Appendix 10 lists surface disturbance assumptions and estimates for the WSA.)

Because potentially disturbed areas would be smaller than under the No Action Alternative (21 vs. 223 acres), the impacts from development and surface disturbance on air quality, geology, vegetation, water, livestock, forest, and cultural resources would be insignificant as described for the No Action Alternative. Wilderness designation would provide additional protection to these resources. Other effects on these resources due to changes in management are discussed below.

SOILS

It is estimated that up to 21 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.6 cubic yards/acre/year. Soil loss on the 21 acres would increase from 13 cubic yards/year to 105 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 92 cubic yards (2.9 percent) over current annual soil loss. This would be a reduction of erosion from the No Action Alternative of 889 cubic yards (28.1 percent).

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Approximately 3,510 acres (3,070 acres pre-FLPMA and 440 acres post-FLPMA) are under oil and gas leases. However, no exploration or development of oil and gas is presently occurring within the WSA.

Existing pre- and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases will be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases will not be reissued.

Exploration for and development of a potential resource of up to 3 million barrels of oil or less than 18 billion cubic feet of natural gas potentially recoverable could be foregone under this alternative. However, due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities, it is concluded that this alternative would not result in any significant loss of potential oil and gas recovery.

Potash

If deposits occur, they would generally contain less than 1 million tons of potash. No leases for potash occur in the WSA. The potential for development of 1 million tons of potash (750,000 tons recoverable) would be foregone. However, the potential for this resource is low within the WSA, and the likelihood for development is thought to be minimal even without wilderness designation.

Locatable Minerals

Approximately 60 acres are under the 20 mining claims within the WSA. Up to 100,000 tons of manganese and up to 500 tons of uranium oxide could occur within the WSA. Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation under unnecessary or undue degradation

guidelines. If minerals are on claims located prior to wilderness designation, it is estimated that up to 21 acres could be disturbed due to exploration and development of the locatable mineral resource. The worst-case impact to minerals would occur if the potentially recoverable minerals are not within mining claims filed prior to designation. In that case, the potential for recovery of up to 100,000 tons of manganese and 500 tons of uranium oxide would be foregone. Because production of these metals is not currently occurring and economic considerations (e.g., transportion, low potential, etc.) are unfavorable, it is unlikely that development would occur even without wilderness designation. Therefore, this alternative would not result in any significant loss of recoverable manganese and uranium resources.

WILDLIFE

Under this alternative, some wildlife could benefit due to the preservation of solitude. Wilderness designation would protect the 2,700 acres of crucial deer winter range. There are no identified wildlife-related vegetation treatments or facilities planned within this WSA; therefore, no potential for wildlife habitat development would be foregone.

Disturbance due to exploration of locatable mineral resources could disrupt wildlife populations and result in these species leaving the disturbed area. Golden eagle, a sensitive species, would remain the same in much of the WSA, except in those 21 acres of potential mineral disturbance. Before authorizing surface-disturbing activities the BLM would carry out necessary measures to protect threatened, endangered, or sensitive species as described for the No Action Alternative; therefore, it can be reasonably concluded that the viability of populations of threatened, endangered, or sensitive animal species would be preserved under this alternative.

FOREST RESOURCES

Forest products could not be harvested. The estimated less than 740 cords of fuelwood would be foregone with designation. However, this would not be a substantial loss to the forest resource due to the limited existing use in the WSA and the availability of these resources closer to population centers.

LIVESTOCK

The entire 5,290 acres would continue to be unused for domestic livestock grazing. Future livestock grazing would not be allowed. There are no usable range improvements within the WSA and none are planned. New rangeland improvements would be allowed if determined necessary for the purposes of wilderness protection and the effective management of these resources.

VISUAL RESOURCES

Wilderness designation would contribute to the preservation of the area's visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I, which generally allows for only natural ecological change, and through closure of the entire area to future mineral leasing and location.

Under this alternative, the disturbance from the possible mineral-related surface disturbance would be reduced from 223 acres to 21 acres associated with development of valid mining claims. Although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation some permanent localized degradation could be expected. If vehicle access for development of valid mining claims (worst-case analysis) were to occur, VRM Class I objectives might not be met on large portions of the WSA. Because the potential for development of mining claims is low, visual quality would probably not be reduced in the WSA as a whole.

CULTURAL RESOURCES

Approximately 21 acres (0.40 percent of WSA) could be disturbed by mineral exploration and development in areas that would be designated wilderness; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any and all proposed surface disturbance and would mitigate any adverse impacts. Inadvertent loss or damage to cultural resources, including three recorded and 125 potential sites, could occur; however, these impacts are expected to be minimal.

There is a potential for increased vandalism to cultural resources due to increased recreational use of the WSA. However, protection afforded by wilderness management would outweigh any potential vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

Although use is currently low (less than 100 visitor days a year), the WSA has outstanding primitive recreational values. If designated, those high

quality recreational opportunities would be recognized, managed, and preserved. Motorized recreation would not be allowed on the 5,290 acres in the WSA if it were designated wilderness. The nonmotorized recreation activities would be enhanced due to the limiting of surface-impacting activities.

As discussed for the No Action Alternative, recreational use of the WSA could increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Access limitations could result in the future use remaining approximately the same as at present; therefore, publicity regarding the WSA likely following wilderness designation is not expected to add a significant increase in primitive recreational use. Management through a Wilderness Management Plan would control future recreation use. Due to steep access and the low levels of expected use, the quality of the primitive recreation experience probably would not be affected.

Mineral-related surface disturbance on up to 21 acres could cause localized impairment of recreation values.

Little impact on ORV recreational use would be expected due to the lack of such activity in the area.

It is concluded that this alternative could benefit recreation by reducing the likelihood for surface-disturbing activities and increasing management attention and recognition of recreational values. Because the potential for mineral production is low and wilderness designation would reduce the potential for surface disturbance, the quality of the primitive recreational experience would likely be preserved throughout the area.

WILDERNESS VALUES

Designation and management of all 5,290 acres as wilderness would contribute to the preservation of the wilderness values of size, naturalness, and outstanding opportunities for solitude and primitive recreation. Under this alternative, the potential for surface-disturbing activities that could impair wilderness values would be reduced through management under VRM Class I (which generally allows for only natural ecological change) and through closure of the entire area to future mineral leasing and location. Naturalness would be preserved on all 5,290 acres that meet the standards. Solitude would be preserved on all 5,290 acres. Primitive and unconfined recreation presently is not outstanding due to the size and confined nature of the mesa top, but the primitive conditions would be preserved on all 5,290 acres. Wilderness designation on 5,290 acres would protect the special features present.

Where valid mining claims are developed, opportunities for primitive recreation, solitude, and special features could be degraded in localized areas where an estimated 21 acres of surface disturbance could result from allowable mineral exploration activities. These disturbances could have long-term effects on primitive recreation values and special features, but would not be expected to significantly affect wilderness values in the area as a whole.

Thus, wilderness designation and management of all 5,290 acres of the Bridger Jack Mesa WSA would protect and preserve the wilderness values of naturalness, special features, solitude, and primitive recreation (except in localized areas) and no significant loss of wilderness values would be expected.

LAND USE PLANS AND CONTROLS

The existing BLM Indian Creek-Dry Valley MFP does not provide for wilderness designation. Wilderness designation would be compatible with the MFP, which suggests that the area be closed to surface-impacting activities. The forthcoming San Juan RMP will acknowledge the wilderness study but will not cover wilderness designation. Congressional designation of the WSA as wilderness would be an amendment to the applicable BLM land use plan.

The *San Juan County Master Plan* recommends multiple use of all public lands in the county. This alternative would not totally conflict with the multiple-use concept since some existing resource uses would continue, although under more restrictive conditions. However, designation would conflict with the county's concept of multiple use because oil and gas leases would expire and future leasing and location of minerals would not be allowed. Since there are no State lands within the WSA, wilderness designation would not conflict with the policy of the State of Utah to maximize economic returns.

SOCIOECONOMICS

Overall there would be no significant changes in current trends of population, employment, and local income distributions.

Because of restrictions placed on the use of resources under wilderness designation, there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative.

The potential for mineral development in the WSA is low (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they would be with mineral development under the No Action Alternative. Because the potential for mineral development is low, it is estimated that potential mineral-related local income would not be significantly reduced by wilderness designation. However, any local income related to assessment of future mining claims would be lost.

The loss of 3,510 acres now leased would cause an eventual loss of up to $10,530 per year of lease fees to the Federal Treasury. There would also be a potential $5,340 annually in Federal revenues foregone from the 1,780 acres that could otherwise be leased in the future. Any potential revenue from future potash leases would also be foregone. In addition to these rental fees, any potential royalties from oil, gas, and potash production could be foregone, although the potential is low.

Due to site characteristics and access, recreation use is expected to remain at about the same level (less than 100 visitor days), and related local expenditures would be insignificant with designation.

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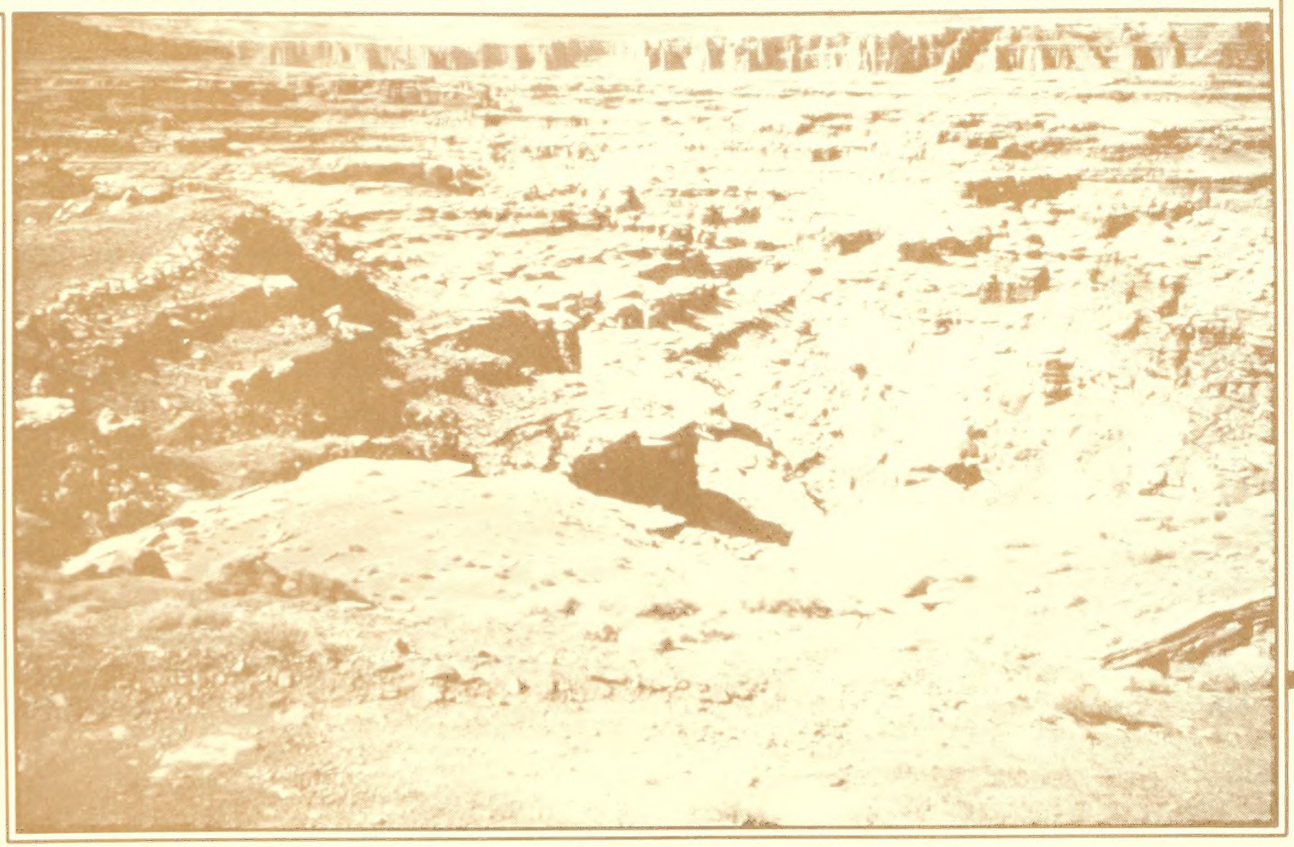
Indian Creek WSA



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INDIAN CREEK WSA
(UT-060-164)

INTRODUCTION

General Description of the Area

The Indian Creek Wilderness Study Area (WSA) is in the Canyonlands region of San Juan County. The WSA covers 6,870 acres of public land administered by the BLM. Acreage differences between those reported in this Environmental Impact Statement (EIS) and the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980) (7,300 acres) are due to recalculations using more accurate measurement methods. The WSA is about 5.50 miles long (north to south) and varies from 1.50 to 3.50 miles wide (east to west). It is approximately 40 road miles northwest of Monticello, Utah. Portions of lower Indian Creek and Rustler Canyon are within this WSA. Canyonlands National Park borders the WSA on the west and the north.

Rugged slickrock landscape characterizes the Indian Creek WSA. Many steep drainages dissect the northern portion of the unit. Indian Creek is a deep canyon with steep rock walls. The rock outcrops and ledges are the major source of scenery. Some of the canyons are almost 300 feet deep.

Over 75 percent of the area is slickrock. The WSA is characterized by bare rock surfaces, plateaus, and steep-walled canyons. The topography consists of numerous narrow twisting gullies and canyons cut into sparsely vegetated red rock.

Vegetation is comprised of desert shrub communities of blackbrush, shadscale, Mormon tea, galleta, and Indian ricegrass.

Canyonlands National Park's weather station is approximately 6 air miles away from Indian Creek WSA. The average annual temperature at Canyonlands is 53 degrees Farenheit (F) with an average low of 38 degrees F and an average high of 69 degrees F. The record low is -11 degrees F, and the record high is 105 degrees F.

Annual precipitation averages about 8 inches per year in the WSA. January, March, and August are the driest months. June, September, and October are the wettest months.

Specific Issues Identified in Scoping

General issues pertaining to more than Indian Creek WSA are discussed in Volume I. Issues and concerns raised in public scoping meetings (USDI, BLM, 1984) and specific to Indian Creek WSA are responded to below:

1. *Comment:* Does this area have important oil and gas leases?

Response: The entire WSA (6,870 acres) is open to mineral location, mineral leasing, and mineral sale. There are five pre-FLPMA (Federal Land Policy and Management Act) (4,470 acres) and two post-FLPMA (2,400 acres) oil and gas leases. There are no known reservoirs of oil and gas in this unit and the potential for recoverable oil and gas is rated as low (refer to the Affected Environment, Mineral and Energy Resources section). (Also, refer to the response for Comment 6.)

2. *Comment:* There are "two grazing permits in this area."

Response: The WSA contains portions of two allotments used by two cattle operators (refer to the Affected Environment, Livestock and Wild Horses/Burros section). Grazing use could continue even if the WSA were designated as wilderness.

3. *Comment:* How were the boundary lines for this WSA established? The boundary, excluding where it joins Canyonlands National Park and two adjacent State sections, follows legal subdivisions for a total of 8 miles. About .50 mile of Indian Creek Canyon is left out for no apparent reason. The boundary as it stands is not an identifiable ground feature, and should be adjusted outward until it is.

Response: Boundary lines followed section lines that approximated the canyon slopes to exclude roads and disturbed areas. These exclusions came as a result of public comment. Two miles of Indian Creek Canyon are severed by overlapping State sections. Due to the terrain, there is not a definable rim (refer to Alternatives Considered and Eliminated From Detailed Study section).

STATEWIDE
POCKET MAP
WSA
NO. 54
SEE VOL. I

4. *Comment:* Because of the narrow configuration (1.50 to 3.50 by 5.50 miles), solitude would be difficult.

Response: All 6,870 acres meet the outstanding opportunities for solitude criteria. Occasional off-road vehicle (ORV) use is all that affects opportunities to find solitude. Entrenched meandering canyons (including their side tributaries), divided by topographic features, create several visual zones that enhance the opportunities for solitude. The opportunities for solitude are further enhanced when the large area proposed as wilderness in the adjacent Canyonlands National Park (105,980 acres) is considered.

5. *Comment:* The WSA is adjacent to Canyonlands National Park, which has similar characteristics. If this WSA were outstanding, it would have been included in the Park.

Response: The WSA contains wilderness values. Determining whether or not it contains National Park qualities as well is not within the scope of the wilderness review.

6. *Comment:* The oil and gas potential of the WSA is ranked low by Science Applications, Inc. (SAI, 1982). Based on proprietary information, representatives of the oil and gas industry believe the potential of the WSA to be at least moderate. This information should be considered in the Draft EIS.

Response: At this time, BLM has not made an independent assessment of geologic information gathered by oil and gas companies. The SAI (1982) report will be used as the reference on oil and gas potential for this EIS, but information provided by the oil and gas industry and available mineral investigation reports by the USDI, Geological Survey and Bureau of Mines will be reviewed by BLM prior to making final wilderness recommendations to the Secretary of the Interior.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated From Detailed Study

During scoping, it was suggested that an alternative be identified with a boundary that follows identifiable ground features. The size and characteristics of the area do not lend themselves to a readily apparent ground feature. The section lines used to define the WSA appear to best encompass the area that meets the naturalness criterion; therefore, this alternative was not included for detailed study.

Alternatives Analyzed

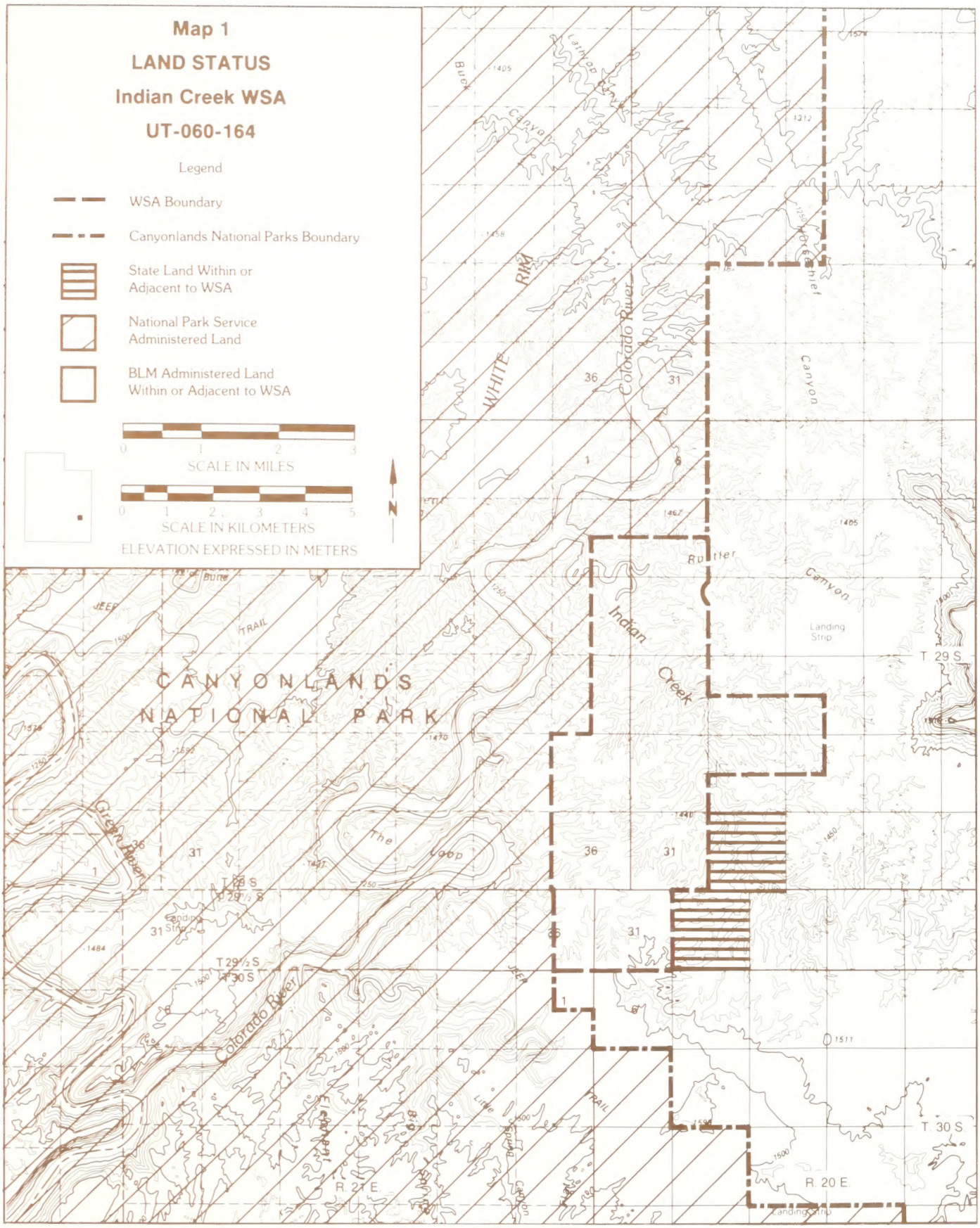
Two alternatives are analyzed for this WSA: (1) No Action; and (2) All Wilderness (6,870 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 6,870-acre Indian Creek WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the Indian Creek-Dry Valley Management Framework Plan (MFP) (USDI, BLM, 1977) until that plan is superseded by the San Juan Resource Management Plan (RMP) currently scheduled for completion in 1986. The two sections of State land adjacent to the WSA (refer to Map 1) have not been identified in the MFP for special Federal acquisition through exchange or purchase. No State, private, or split estate lands are located within the WSA.

The following are specific actions that would take place under this alternative:

- All 6,870 acres would remain open to mineral location, leasing, and sale. Development work, extraction, and patenting would be allowed on 18 existing mining claims (320 acres) and future mining claims. Development would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases on the entire 6,870 acres could be developed under leasing Category 1 (standard stipulations).
- The present domestic livestock grazing use of 39 Animal Unit Months (AUMs) in the WSA would continue as authorized in the MFP or other applicable BLM planning document. Use of the existing range developments (one 30-yard-long gap fence) would continue. New rangeland improvements could be implemented without wilderness considerations; however, none are now proposed.


Map 1
LAND STATUS
Indian Creek WSA
UT-060-164
Legend
WSA Boundary
Canyonlands National Parks Boundary
State Land Within or Adjacent to WSA
National Park Service Administered Land
BLM Administered Land Within or Adjacent to WSA
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
CANYONLANDS NATIONAL PARK
Colorado River
WHITE RIM
Indian Creek
Butler Canyon
Landing Strip
JEEP TRAIL
Green River
The Loop
T 29 S
T 30 S
R. 21 E
R. 20 E
36
31
1

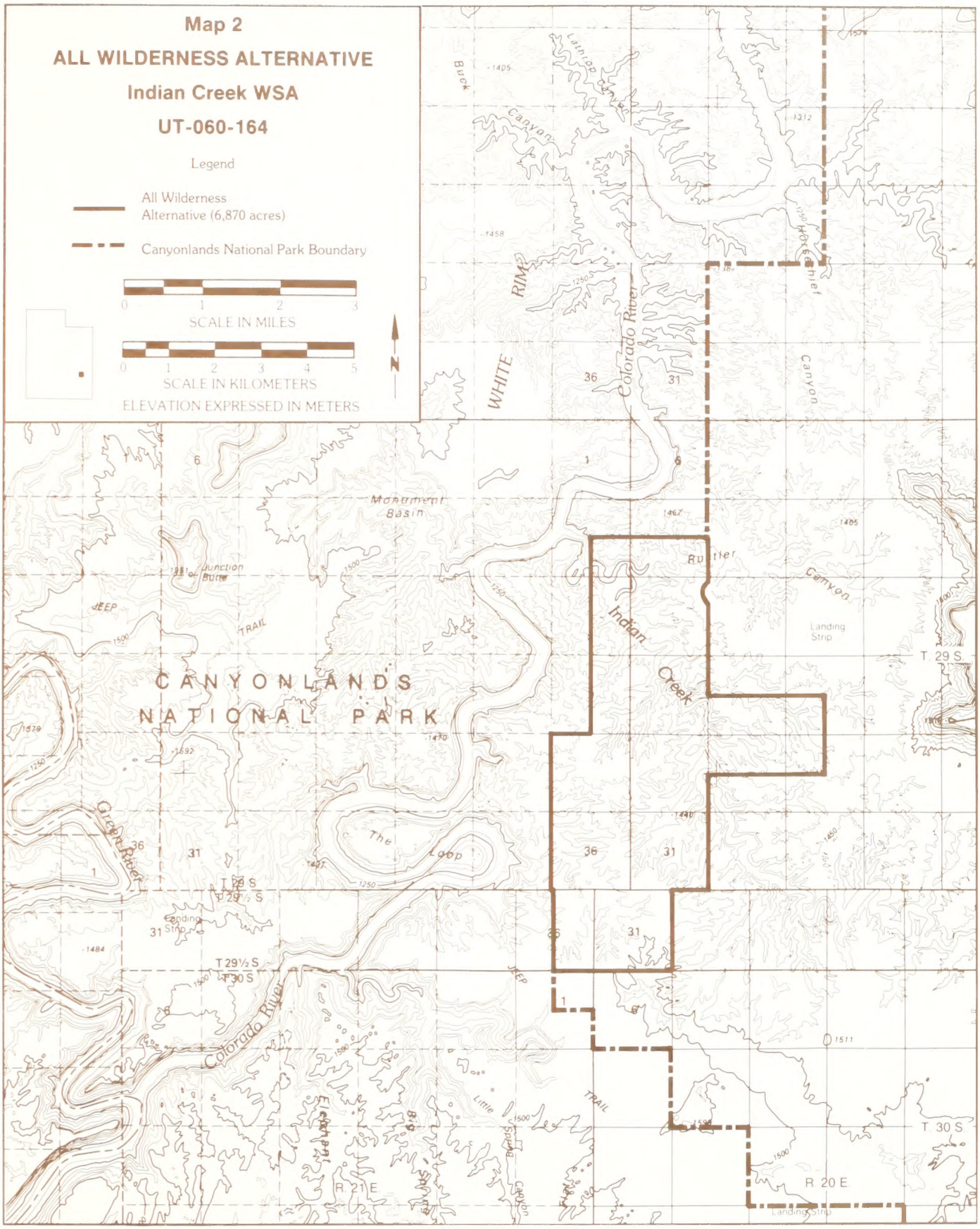
- Development of facilities and improvements for wildlife, water resources, etc. could be allowed if in conformance with the MFP. None exist or are currently planned for the area.
- The entire WSA acreage would be open to ORV use and new access routes for development would be allowed. No ORV use currently exists in the WSA and potential use is severely limited by rough terrain.
- The entire area would be open to woodland product harvest. However, there are no forest resources in the WSA.
- The entire 6,870-acre area would continue to be managed as Visual Resource Management (VRM) Class II.
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under the All Wilderness Alternative, all 6,870 acres of the Indian Creek WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. Upon designation, no acquisition of the State land adjacent to the WSA (refer to Map 1) would be likely. The figures and acreages given under this alternative are for Federal lands only. No State, private, or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 6,870 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the approximately 320 acres of existing mining claims that may be determined to be valid. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809), with consideration given to wilderness values. Existing oil and gas leases, involving 6,870 acres of the WSA, would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.
- Present domestic livestock grazing would continue as authorized in the Indian Creek-Dry Valley MFP until that plan is superseded by the San Juan RMP scheduled for completion in 1986. The 39 AUMs in the WSA would remain available to livestock as presently allotted. The use and maintenance of rangeland developments existing at the time of designation (one 30-yard-long gap fence) could continue in the same manner as in the past based on practical necessity and reasonableness. After designation, new rangeland developments would be allowed on a case-by-case basis if necessary for rangeland and/or wilderness resource protection and management, as long as special criteria to protect wilderness values are met (refer to Appendix 1). No new facilities are now proposed.
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are located in the Indian Creek WSA, and none are currently planned.
- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values, as long as criteria to protect wilderness values are met. No wildlife developments are existing or planned in this WSA.
- The entire 6,870-acre area would be closed to ORV use except for: (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2)


Map 2
ALL WILDERNESS ALTERNATIVE
Indian Creek WSA
UT-060-164
Legend
All Wilderness Alternative (6,870 acres)
Canyonlands National Park Boundary
SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
CANYONLANDS NATIONAL PARK
Monument Basin
Junction Butte
Jeep Trail
Indian Creek
Rattler Canyon
Landing Strip
T 29 S.
T 30 S.
R 20 E.
R 21 E.
The Loop
Green River
Colorado River
White Rim
Horse Thief Canyon
Lavinia Canyon
Little Bridges Canyon
Big Bridges Canyon
Trail

occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. Less than 1 mile of existing vehicular ways in the WSA would not be available for vehicular use except as indicated above. About 1 mile of road, which forms part of the northeast boundary of the WSA, would remain open to vehicular use.

- A specific Wilderness Management Plan would be developed to govern use and protection of the 6,870-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pinyon nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products at the present time, and none is specifically planned.
- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Unless otherwise indicated, information for this section was taken from BLM technical reports and documents.

Air Quality

Currently Indian Creek WSA is located in a Prevention of Significant Deterioration (PSD) Class II area as defined in the 1977 Clean Air Act as amended. However, a Class I area (Canyonlands National Park) is contiguous to Indian Creek WSA. Only very low levels of air quality degradation are allowed in Class I areas, and practically any air quality deterioration would be considered significant. The Class II air quality classification would allow for moderate increases in air pollution. The air quality is good over the WSA.

Background visibility range is estimated to average 100 to 132 miles during the summer (Aerocomp, Inc., 1984). Generally, the average visibility is greater in the winter than in the summer.

INDIAN CREEK WSA
TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
INDIAN CREEK WSA

Resource	Alternatives	
	No Action	All Wilderness (6,870 Acres) (Proposed Action)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil, 18 billion cubic feet of natural gas, 750,000 to 7.5 million tons of potash, 1,000 tons of uranium oxide, and 50,000 tons of copper.	Oil, gas, and potash likely would not be recovered. Assuming a worst-case analysis, copper and uranium recovery would also be foregone. Due to the low likelihood of recovery of these mineral resources, however, the loss of development opportunity would not be significant.
Wildlife	About 9 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.
Livestock	Grazing of 39 AUMs and maintenance of 30 yards of existing fence would continue. New developments could be constructed; however, none are now proposed.	Grazing of 39 AUMs and maintenance of 30 yards of existing fence would continue. Little effect on grazing management is expected. New developments proposed in the future might not be allowed.
Visual Resources	The quality of visual resources could be impaired on up to 620 acres (9 percent) of the WSA. This could reduce the quality of visual resources throughout the WSA.	Visual quality could be impaired on up to 40 acres. The quality of visual resources would probably be preserved in the WSA as a whole.
Recreation	ORV use would continue on less than 1 mile of ways at current low levels. Overall recreational use could increase from the present 100 visitor days per year to 148 over the next 20 years. Up to 620 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including less than 1 mile of ways, would be closed to ORV use. Recreational use could increase to up to 344 visitor days per year due to publicity associated with wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 620 acres (9 percent of the WSA). This could reduce wilderness values throughout the WSA.	Wilderness values would be protected, except on 40 acres (0.58 percent of the WSA) which may be disturbed by development of valid mineral rights.
Land Use Plans and Controls	This alternative would be consistent with the *San Juan County Master Plan,* State of Utah plans and policies, and the current BLM Indian Creek-Dry Valley MFP. It would not complement the NPS proposal for nearby wilderness.	This alternative would not be consistent with San Juan County's concept of multiple use. It would not conflict with State plans, and would complement the NPS proposal for wilderness. Designation would constitute an amendment to the BLM Indian Creek-Dry Valley MFP or the San Juan RMP.
Socio-economics	Annual local sales of less than $2,990 and Federal revenues of up to $20,665 would continue.	Annual local sales of less than $2,990 and Federal revenues of up to $55 would continue, but Federal revenues of up to $20,610 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.

Geology

Indian Creek WSA is within the Canyonlands Section of the Colorado Plateau Physiographic Province. This section is characterized by bare rock surfaces, plateaus, and steep-walled canyons. The topography of this WSA consists of numerous narrow twisting gullies and canyons cut into sparsely vegetated red rock. Elevation ranges from 4,000 to 4,800 feet above sea level.

Surface outcrops in the northern part of the WSA consist of the Cutler Formation. The rest of the surface outcrops within the unit are mapped as the Cedar Mesa Sandstone Member of the Cutler Formation. The geology in this area is somewhat complicated because the fluvial arkosic sandstone and shales, of the Cutler and Rico Formations interfinger with the sandstones, shales, and limestone of the Cedar Mesa Sandstone and Elephant Canyon Formations. The Rico Formation underlies the Cedar Mesa Sandstone and crops out along Indian Creek. In this vicinity the Rico is recognized as the upper half of the Elephant Canyon Formation up to the base of the Cedar Mesa Sandstone.

Indian Creek WSA lies along the north-plunging nose of the Monument Upwarp—a major north-trending structural division of the Colorado Plateau. The broad upwarp is asymmetrical; dips on the west average 2 degrees, and dips on the east average approximately 50 degrees.

Other structural features in the area include Gibson Dome to the southeast, Rustler Dome to the north, and Meander Anticline to the west. The Needles Fault Zone, a complex of horsts and grabens, lies about 4 miles to the southwest.

Soils

The soils in this WSA have been mapped and described in the *Canyonlands Soil Survey* (U.S. Department of Agriculture, Soil Conservation Service, 1978). The majority of this WSA is composed of rock outcrop and shallow soils. There are small areas of deep sandy soils in basins or on leeward sides of obstructions such as ridges where sand has accumulated (refer to Table 2).

Under present conditions, average soil loss from erosion is estimated to be about 0.35 cubic yard/acre/year. Total annual soil loss for the entire WSA is approximately 2,438 cubic yards (refer to Table 3).

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year)	
			Present Condition	Bare Soil Surface
Rock outcrop	60	4,123	0.0	0
Shallow loamy soils on sloping structural benches	35	2,404	1.0	5
Very deep sandy soils on gently sloping structural benches and along drainings	5	343	0.1	1
Totals	100	6,870		

Source: Hansen, 1985.

Vegetation

Existing desert shrub communities of blackbrush, shadscale, Mormon tea, galleta, and Indian ricegrass cover approximately 25 percent of the WSA. The other 75 percent of the area is mostly barren (refer to Table 4).

The barren areas are basically bare rock or soil and drainage bottoms with a low density of plants. Part of the barren areas have steep slopes and deep canyons. Scattered vegetation growing in shallow drainages and soil pockets of the barren areas consist of blackbrush, Mormon tea, coldenia, single leaf ash, skunkbrush, scattered juniper, and galleta.

Vegetation along the bottoms of Indian Creek and Rustler Canyon consist of tamarisk, willow, cottonwood, big rabbitbrush, copperweed, common reedgrass, saltgrass, greasewood, fourwing saltbush and Indian ricegrass. The WSA contains about 12 acres of riparian vegetation along Indian Creek.

There are no known threatened or endangered plant species in the WSA. One species (*Astragalus monumentalis*) that may occur within the WSA is a sensitive species currently under review by the Fish and Wildlife Service (FWS) for possible threatened or endangered status.

The Indian Creek WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The map identifies the entire WSA as having a potential natural vegetation (PNV) type of blackbrush. PNV is the vegetation that would

Table 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions			Annual Soil Loss if Disturbed		
		Percent of Area	Acres	Cubic Yards	Percent of Area	Acres	Cubic Yards
Very High	20.0	0	0	0	0	0	0
High	10.0	0	0	0	0	0	0
Medium	5.0	0	0	0	35	2,404	12,020
Low	1.0	35	2,404	2,404	5	343	343
Very Low	0.1	5	343	34	0	0	0
None	0.0	60	4,123	0	60	4,123	0
Totals		100	6,870	[1]2,438[1]	100	6,870	[1]12,363[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.35 under present conditions; 1.80 if disturbed.

exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Desert shrub	1,707	25
Barren	5,163	75
Totals	6,870	100

Source: USDI, BLM, 1977.

Water Resources

There are no water wells or reservoirs in the Indian Creek WSA. There is an undeveloped seep below the Rustler Canyon pouroff that is utilized by cattle and wildlife. Water is available in low quantities yearlong in Indian Creek which flows through the WSA for about 4 miles and then into the Colorado River about .50 mile to the northwest. Water quality is good and cattle utilize the water during the winter months. The majority of the water has already been appropriated by private landowners to upstream uses. There is no potential for irrigation in this WSA.

Hydraulic interconnection of aquifers is not widespread in the area, and underground water is possibly found in isolated pockets at two levels. Water in the upper level is of low salinity and suitable for use by livestock and wildlife. Discharges are by evaporation, springs, and subriver level seeps to the Colorado River and associated drainages. Water in the lower level is high in salt with total dissolved solids (TDS) ranging from 80,000 to over 300,000 milligrams per liter (USDI, BLM, 1982c).

Mineral and Energy Resources

The BLM, in cooperation with the U.S. Department of Energy, had each WSA assessed for its energy and mineral resources by SAI (1982). Refer to Appendix 5 for a description of the SAI rating system. Refer to Table 5 for the energy and mineral resources rating summary for the WSA.

An overall importance rating (OIR) of 2 was assigned to the Indian Creek WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA. The overall importance rating applies to 75 to 100 percent of the unit evaluated by SAI.

TABLE 5
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f2	c2	Less than 10 million barrels of oil; less than 60 billion cubic feet of gas
Potash	f3	c3	1 to 10 million tons
Copper	f2	c1	Less than 50,000 tons
Uranium/ Vanadium	f3	c2	Less than 1,000 tons of uranium oxide
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f1	c4	None
Manganese	f1	c1	Little to none

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. The WSA could contain deposits of vanadium and copper that are currently listed as strategic and critical materials (Federal Emergency Management Agency, 1983). Although listed as strategic, copper is relatively common. Supplies currently exceed domestic demand.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by FLPMA. BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

LEASABLE MINERALS

Due to unfavorable geologic conditions it has been determined that no coal, geothermal, or other leasable resources, with the exception of oil or gas or potash are present in this WSA. Also there are no leases for these resources in the WSA.

Oil and Gas

There are no known reserves of oil and gas in this WSA. Many wells have been drilled along nearby dominant structures (Gibson Dome, Rustler Dome, etc.) and some oil and gas shows have been reported. Most of the wells penetrated Mississippian and/or Devonian rocks, but the general area is not thoroughly tested because very few wells have been drilled west of the WSA.

Pennsylvanian and certainly Permian rocks in and near the unit probably do not contain large reserves of oil and/or gas. On the other hand, small accumulations that were effectively sealed from drainage into the Colorado River may still exist in Pennsylvanian rocks underlying the unit. The most favorable oil and gas prospect in the vicinity of the unit is a structural trap affecting Mississippian rocks, as well as the possibility for small accumulations in Pennsylvanian stratigraphic traps. Although the results of nearby drilling have been discouraging, the unit was nevertheless assigned a low oil and gas favorability rating and a low rating for certainty of resource occurrence. Less than 10 million barrels of oil in-place and 60 billion cubic feet of natural gas in-place may occur within the WSA with less than 3 million barrels of oil and 18 billion cubic feet of natural gas that may be recoverable (refer to Appendix 6 for recoverability estimates).

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases. The WSA contains five pre-FLPMA leases covering 4,470 acres and two post-FLPMA leases covering 2,400 acres.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized

field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

The entire WSA is in oil and gas leasing Category 1 (open with standard stipulations).

Potash

Potash is an important component in fertilizers and is a relatively scarce commodity in the U.S. The only known potash-bearing unit in the Moab District is the Paradox Formation of Pennsylvanian age. The unit lies a few miles southwest of the thickest potash-bearing zones in the Paradox Formation, although it is underlain with potash-bearing formations.

On this basis, the unit is assigned a moderate favorability for potash (between 1 million to 10 million tons in-place with a recoverable resource of between 750 thousand and 7.5 million tons) (refer to Appendix 6). There is a moderate certainty that this resource exists.

The tract lies in close proximity to the Colorado River, which could be an advantage for eventual solution mining. However, the river lies within Canyonlands National Park at this location and is located on the thinnest edge of the potash deposit; this makes the prospect for development demand in the near future unlikely. There are presently no potash leases covering the unit, and no prospecting permits have been issued for the immediate area. Potash could underlie all 6,870 acres of the WSA.

LOCATABLE MINERALS

Uranium and associated minerals could occur in the WSA. Other locatable minerals, such as lead, manganese, zinc, and silver are not found in the WSA due to geologic unfavorability.

Uranium and Associated Minerals

Several small deposits of uranium have been discovered near the northern portion of this WSA. Indian Creek WSA is situated within the Indian Creek Mining District. Uranium-bearing outcrops of the Cutler Formation in the vicinity of Indian Creek were discovered by local prospectors in 1951. The first shipments from this area were made in 1953. The small deposits that were found were quickly mined out and there has been no active mining for many years.

Eighteen lode mining claims (320 acres) with current assessments have been located within the unit (all are post-FLPMA). Geologic conditions within the unit have moderate favorability for uranium and vanadium deposition, and some small deposits may exist. The unit has potential for less than 1,000 tons of uranium oxide. The certainty that uranium resources occur in this area is also low. Uranium and vanadium could underlie all 6,870 acres in the WSA. There has been no mining in the WSA.

Uranium mines in the Chinle Formation surrounding the WSA all contain some copper. Copper production from the Moab District has come largely from four areas: (1) near the Town of Moab; (2) the Big Indian/Lisbon Valley area; (3) the White Canyon area; and (4) the Monument Valley area. The deposits are confined chiefly to the Chinle Formation of Triassic Age, particularly the Shinarump Member. Cumulative copper output from each of the four areas has been far less than 50,000 tons. There has been no production in the WSA.

The Chinle and other redbed sandstones throughout the Colorado Plateau (and in the vicinity of the WSA) are not very favorable for large, or even moderate, accumulations of copper. Nevertheless, copper occurs widely throughout the Plateau and is clearly associated with uranium deposits which do occur in this area. The WSA has been assigned a copper favorability of low with the potential for less than 50,000 tons of contained copper. The certainty of resource occurrence is very low. Copper could underlie all 6,870 acres of the WSA.

SALABLE MINERALS

The salable minerals within the unit have little or no commercial potential. The poor quality and quantity of the minerals available and the remote nature of the deposits render them totally valueless as a resource.

Wildlife

No BLM sensitive species nor threatened or endangered species have been identified in this WSA by the FWS.

Desert bighorn sheep tracks are occasionally found along Indian Creek, and bighorn rams have been sighted northeast of the WSA. All of the WSA (6,870 acres) is crucial bighorn sheep habitat.

There is very little mule deer use in these portions of Indian Creek and Rustler Canyon. Coyote, cottontail rabbit, whitetail antelope squirrel, Ord kangaroo rat, and deer mice inhabit the Indian Creek WSA.

Common ravens, rockwren, ash-throated fly-

catcher, lark sparrow, black-throated sparrow, mourning dove, and chukar are also found within the WSA. Chukars were introduced during the 1950s from Asia as a gamebird. Juncos are the most common wintering bird species. The side-blotched lizard, sagebrush lizard and northern whiptail are the most common reptile species in this area. There are no existing or proposed wildlife management facilities or vegetation treatments for wildlife enhancement in the WSA. No wildlife transplants are currently proposed.

Forest Resources

There are no forest resources in the Indian Creek WSA. There are a few scattered junipers, but harvestable fuelwood is unavailable.

Livestock and Wild Horses/Burros

Livestock grazing began during the 1880s. Livestock access is through Indian Creek, Rustler Canyon, and a few other unnamed drainages. Indian Creek is a natural barrier that acts as a boundary between two grazing allotments. Indian Creek Allotment is south of Indian Creek, and Harts Draw Allotment is north of Indian Creek. Allotment information is summarized in Table 6.

The September 16 to May 15 season of use for Hart Draw Allotment occurs every third year in accordance with a Forest Service grazing plan. This grazing plan is being run on an experimental basis and the September 16 to May 15 dates may revert back to the October 16 to June 15 dates if the Forest Service plan is discontinued.

Grazing in the WSA portion of the Hart Draw Allotment occurs primarily during the winter (December 1 to March 31). It is estimated that there are approximately 12 AUMs of forage produced in the Hart Draw portion of the WSA. Estimated grazing use is by three cattle for the 4-month grazing season.

Grazing in the WSA portion of the Indian Creek Allotment occurs primarily during the spring (March 1 to April 30). It is estimated that there are approximately 27 AUMs of forage produced in the Indian Creek portion of the WSA. Estimated grazing use is by 14 cattle for the 2-month grazing season.

The only livestock development in the WSA is a fence for livestock control in Rustler Canyon. The fence is about 30 yards long and is of steel posts and four-strand barbed-wire construction. No range improvements are proposed in the WSA.

There is no wild horse or burro use within the WSA.

Visual Resources

The WSA is located in an area which was inventoried and evaluated with the BLM's VRM system in 1980. (Refer to Appendix 7 for an explanation of BLM's VRM rating system.)

The WSA is composed of highly eroded canyon systems where unusual rock formations combine with rich color contrasts to create a memorable landscape. Indian Creek Canyon and Rustler Canyon, with their numerous side drainages, are the major landform features of the WSA. The forces of

Table 6
Livestock Grazing Use Data

Allotment	Class of and Number of Livestock	Number of Operators	Season of Use	Total Allot Acres	WSA Acres in Allot.	Percent of WSA in Allot.	Total AUMs in Allot.	AUMs in WSA
Hart Draw	308 cattle	1	09/16-05/15 10/16-06/16	80,450	2,107	2.6	2,460	12
Indian Creek	1,065 cattle	1	10/16-06/16	236,890	4,763	2.0	8,518	27
Totals		2		317,340	6,870			39

Source: USDI, BLM, 1977.

erosion have carved a severely sculptured landscape with deep and winding canyon bottoms, sheer cliff walls, truncated ledges, massive rock outcrops, and rounded rock spires. Rich color combinations of light tans, whites, and pinks to dark reds, maroons, and purples create pleasing contrasts. Textures of the rock vary from smooth to fine to coarse.

The vegetation of the WSA has a little variety, ranging from desert shrubs and grasses on the ledges and slopes to scattered cottonwoods and willows in wash bottoms. Colors are dark to light greens, and textures are fine.

The only cultural modification in this WSA is a gap fence in the lower portion of Rustler Canyon. The entire WSA (6,870 acres) is located in an area evaluated as Class A scenery.

The Indian Creek WSA is located in a high sensitivity area. The entire WSA is located in the foreground-middleground zone, which consists of areas seen from 0 to approximately 5 miles. Portions of the WSA would be visible from the Needles Overlook, which is located on Hatch Point. Due to these factors, the entire WSA (6,870 acres) was given a VRM Class II designation.

Cultural Resources

Little archaeological work has been conducted in the lower Indian Creek area; consequently, there is a lack of site information concerning the Indian Creek WSA. One quad surveyed by Richard Thompson during the 1977 field season was located within the Indian Creek WSA. Not much is known about the cultural resources of the general area north of the Abajo Mountains, except that site densities are lower here than in most of San Juan County and that this locale is transitionally situated between Fremont and Anasazi cultural groups.

Inventory to date in southeast Utah has led to the recognition of several chronologically distinct Anasazi cultural manifestations including Basketmaker and Pueblo groups. Although site and survey information points to exclusive occupation of the lower Indian Creek area by these groups, it is probable that Archaic (Basketmaker I) and Ute/Navajo peoples also made use of this locale.

It should be noted that human occupation in the lower Indian Creek area has been episodical and discontinuous. Because of the relative difficulty in access into the lower Indian Creek area, the WSA potentially contains numerous pristine cultural resources. A literature search revealed no recorded sites. Numerous sites, predominantly rock art, have been documented by amateur archaeologists along the middle stretches of Indian Creek. A few sites have been recorded down along the Colorado River in this general area. It is probable that limited farming occurred in the creek bottom, with the majority of sites being cliff dwellings, which include habitation and/or storage structures (granaries). It is also likely that numerous rock art sites, both pictographs and petroglyphs, are located in this area.

No historic sites (50 years and older) have been recorded within this WSA. The major cultural significance of the WSA lies in its having served as a major transportation corridor from the Colorado River up to the Abajo Mountains. It is also believed that the 1859 Macomb expedition crossed the lower Indian Creek area.

There are no existing National Register sites and/or nominations in this WSA. However, based on estimates from similar settings in the area, it could be expected that 100 sites would be located in the WSA of which 16 would be National Register eligible.

Recreation

Recreational use in this unit has not been monitored and no accurate statistics on visitor numbers or types of recreational activity are available. Interviews with local residents, however, indicate that visitation for recreation purposes (hiking, backpacking, etc.) is extremely sparse in this portion of Indian Creek and accounts for fewer than 100 visitor days per year. The unit adjoins Canyonlands National Park on two sides, but no visitation statistics are available from the NPS on this particular area.

Indian Creek joins the Colorado River .50 mile outside the WSA, and this is a stopover point for float boaters. These recreationists occasionally hike up Indian Creek and into the WSA.

Recreational access to Indian Creek could be challenging in some spots. There is a series of two pouroffs in Indian Creek (.50 mile below Rustler Canyon) and one pouroff in Rustler Canyon (approximately .75 mile up from Indian Creek). The Rustler Canyon pouroff is easily accessible to hikers. Travel past the Indian Creek pouroffs may not be possible. If there is access to the west of the pouroffs, the route would be extremely steep and difficult.

The WSA is currently open to ORV use. However, no ORV use is currently taking place in the WSA,

and potential use is severely limited by the topographic features. There is less than 1 mile of vehicular way in the WSA.

Indian Creek WSA presently offers the visitor solitude and isolation from outside civilized influences. Unusual geologic features in the southern portion of the unit provide for a variety of recreation pursuits, including photography, backpacking, and sightseeing.

Wilderness Values

SIZE

The 6,870 acres encompassing the WSA do not enhance the wilderness values present; however, the WSA is of sufficient size to meet the size criteria. The WSA is roughly up to 5.5 miles long (north to south) and up to 3.5 miles wide (east to west). The WSA is adjacent to The Maze proposed wilderness of Canyonlands National Park (105,980 acres).

NATURALNESS

The WSA is still in a natural condition due to its inaccessibility. The majority of human activity in this unit is associated with cattle grazing. A gap fence has been erected .25 mile up from the mouth of Rustler Canyon to prevent cattle from drifting into Indian Creek. The fence is approximately 30 yards long with four strands of barbed wire and four steel posts. The fence is located in tamarisk, and there is an insignificant visual impact within 60 feet either side of the fence that stretches from rim to rim.

On the point to the west of the Rustler Canyon pouroff are the scattered remains of a missile launched from the Green River Missile Range during the 1960s. The larger portions of the missile were salvaged. There are a few sections of metal 2- to 3-feet long from 1- to 2-feet wide remaining. Most of the scraps are less than 6 inches long, and they have oxidized and now blend into the surrounding environment. Vehicle traffic extends to the northeastern portion of the WSA on a road adjacent to the boundary. Annual assessment work of mining claims is evident along this route, but it is not a significant intrusion within the WSA.

These imprints cover less than 1 percent of the WSA and are substantially unnoticeable in the area as a whole. The entire WSA (6,870 acres) meets the naturalness standard for areas under wilderness review.

SOLITUDE

There are over 10 miles of entrenched meandering canyons within the WSA including Indian Creek, Rustler Canyon, and their side tributaries. These are divided by topographic features creating several visual zones enhancing the opportunities for solitude. The vegetation of the WSA does not enhance the opportunities for solitude due to it limited extent.

The majority of the unit is isolated from off-site intrusions and influences. Occasional ORV use outside the northeast boundary of the WSA is an occasional nuisance, but does not affect opportunities to find solitude to any degree. The entire WSA (6,870 acres) meets the criteria for outstanding opportunities for solitude.

PRIMITIVE AND UNCONFINED RECREATION

The steep, narrow canyon of Indian Creek provides outstanding opportunities for backpacking and associated activities. The WSA meets the criteria for primitive and unconfined recreation on all 6,870 acres.

SPECIAL FEATURES

The Indian Creek WSA provides unspoiled desert landscape with low rising rocky outcrops. The two pouroffs in Indian Creek near the western border of the WSA are picturesque when water is flowing in this intermittent drainage. The two pouroffs drop almost 150 feet.

Because of the inaccessibility of the area, this WSA potentially contains pristine cultural resources that have not been recorded; estimates indicate a potential for up to 100 sites.

Land Use Plans and Controls

The entire Indian Creek WSA is public lands administered by BLM. There are no private or State in-holdings.

Lands on the north and west are National Park lands. The NPS is proposing The Maze (105,980 acres), which is adjacent to the WSA, for wilderness. State land lies adjacent to the WSA on the southeast corner. All other lands adjacent to the WSA are public lands administered by BLM.

Portions of Sections 12, 13, 24, 25, and 36, Township 29 South, Range 19 East, are withdrawn for power site reservation. Any actions on this area must be coordinated with the Federal Energy Regulatory Commission. However, management of the area is BLM's responsibility. No proposal for use of this withdrawal is anticipated.

There are no permits, rights-of-way, or licenses for land uses within the WSA. There are mining claims and mineral leases in the area. These are

discussed in the Mineral and Energy Resources sections of this document.

Access into the area is possible by using U.S. Highway 191 and/or State Highway 211 and county dirt roads. These primitive roads offer access adjacent to the WSA.

The Indian Creek-Dry Valley Planning Unit MFP was completed by BLM in 1977. This plan recommended that Indian Creek be evaluated as a possible wilderness area. This plan is scheduled for replacement by the San Juan RMP in 1986. Current management has favored multiple use as described in the No Action Alternative. Important features of the MFP include leaving the area open to mineral location and sale, and continuing domestic livestock grazing and VRM Class II management.

The WSA lies in San Juan County. The *San Juan County Master Plan* (Planning and Research Associates, 1967) emphasizes multiple use of public lands and zones the WSA as range and forest lands. The Master Plan predates wilderness considerations. The San Juan County Commission (1980) opposes any wilderness areas being legislatively or administratively designated in the County.

Socioeconomics

DEMOGRAPHICS

The WSA lies in northwestern San Juan County. The nearest community is Monticello, approximately 40 road miles southeast. The socioeconomic effects of designation would be confined mostly to San Juan County, which can be summarized as rural and sparsely populated.

San Juan County had a 1982 population of 12,700, not quite 1 percent of the State population (University of Utah, Bureau of Economic and Business Research, 1983). The county's population has been fairly static, registering less than a 2-percent annual growth rate between 1975 and 1982. The majority of the county is unpopulated. The county has two service centers. Monticello, the county seat, had a 1980 population of 1,930 and Blanding, about 20 miles south, had a 1980 population of 3,120 (U.S. Department of Commerce, [USDC], Bureau of the Census, 1981).

San Juan County is one of the largest counties in Utah, comprising 7,885 square miles (about the size of New Jersey). About 85 percent of the county is owned by the Federal Government, 6 percent by the State of Utah, and 8 percent by private landowners (University of Utah, Bureau of Economic and Business Research, 1983). The southern 20 miles of the county are included in the Navajo Indian Reservation.

EMPLOYMENT

Even though local employment in the mining industry decreased by 20 percent between 1980 and 1982 due to a downturn in local uranium mining and milling, it still remains the largest local private employer (refer to Table 7).

TABLE 7
1981 Employment and Income
San Juan County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	2	4
Total Agriculture	2	4
Mining	50	32
Construction	6	3
Manufacturing	4	5
Transportation and Public Utilities	5	5
Wholesale Trade	2	3
Retail Trade	5	9
Finance, Insurance and Real Estate	1	1
Services	8	11
Other	-	-
Total Private Industry	80	70
Federal Government	2	4
State and Local Government	16	22
Total Government	18	26
Total Nonagricultural	98	96
Unemployment (1st Quarter, 1983)		10.4
	(Dollars)	(Jobs)
Total Employment and Income	$59,743,000	3,943

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

Note: Because of rounding, numbers are not additive. Employment percentage figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services.

Recent statistics indicate that mining directly accounts for half of the income and over 32 percent of the employment in the county (USDC, Bureau of Economic Analysis, 1983) (refer to Table 7). Because the mines and mine employees both purchase products locally, mining's total local importance is even greater. Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high, over 10 percent. In addition, about 20 percent of county residents are

on welfare and are therefore not included in unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

INCOME AND REVENUES

Economic-related activities in the WSA include mineral exploration, livestock production, and recreation. Table 8 summarizes local sales and Federal revenues from the WSA. Appendix 9 identifies the multipliers used to estimate sales and revenues.

TABLE 8
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	$20,610
Mining Claim Assessment	$1,800	None
Livestock Grazing	$780	$55
Recreational Use	Less than $410	None
Total	Less than $2,990	Up to $20,665

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total income that would be generated by these expenditures.

The WSA has 18 mining claims all of which are current in assessment work. Regulations require a $100 annual expenditure per claim for labor and improvements, an undetermined part of which is spent in the local economy.

Two livestock operators have a total grazing privilege of 39 AUMs within the WSA. If all this forage were utilized, it would account for $780 of livestock sales and $195 of ranchers' returns to labor and investment annually.

The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for this WSA is estimated as about 100 visitor days per year. Only a portion of the expenditures for recreational use of the WSA contribute to the local economy of San Juan County.

The WSA generates Federal revenues from mineral leases, livestock, and recreation sources (refer to Table 8).

Oil and gas leases in the WSA cover approximately the entire 6,870 acres. At $3 per acre, lease rental fees generate up to $20,610 of Federal revenues annually. Half of these monies are allocated to the State, which then reallocates these revenues to various funds, the majority of which are related to energy development and mitigation of local impacts of energy and mineral development. Average actual livestock use and, therefore, revenues generated from grazing in the WSA are unknown; however, the permittees in the WSA can use up to 39 AUMs per year. Based on a $1.40 per AUM grazing fee, the WSA can potentially generate about $55 of grazing fee revenues annually, 50 percent of which would be allocated back to the local BLM district for the construction of rangeland improvements.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, quali-

fies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown, but would probably be low to moderate based on the WSA's rough terrain and resource potential. The following is a worst-case analysis, based on the assumption that minerals would be developed sometime in the future and would result in the following disturbance: potash, 420 acres; oil and gas, 160 acres; and uranium/vanadium/copper, 40 acres. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed by the State of Utah as a PSD Class II area. Disturbance of 620 acres could result in significant localized increases in fugitive dust emissions depending on the mining methods utilized.

GEOLOGY

No impacts to geology are expected because surface disturbances associated with locatable minerals (i.e., uranium/vanadium/copper, oil and gas, and potash exploration and development activities) would probably not exceed 620 acres. This would not significantly affect the geologic structure of the area.

SOILS

It is estimated that up to 620 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.35 cubic yard/acre/year. Where soils are disturbed, soil loss would increase to about 1.80 cubic yards/acre/year. Soil loss on the 620 acres would increase from 217 cubic yards/year to 1,116 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by as much as 899 cubic yards (37 percent) over current annual soil loss. This increase would be significant. The potential for development of energy and mineral resources in the WSA is low to moderate.

VEGETATION

The anticipated maximum of 620 acres disturbed could result in loss of as much as 36 percent of the area's sparse vegetation. Desert shrub vegetation would be altered and disturbances would probably revert to annual grass until reclamation were complete. Some individual plants of the BLM sensitive species *Astragalus monumentalis* could be inadvertently disturbed. However, before authorizing surface-disturbing activities (620 acres potential), BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken, it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be preserved with the No Action Alternative.

WATER RESOURCES

Opportunities for watershed improvements or expansion of existing water sources could occur as allowed in the current BLM planning document. No developments are currently planned. An unquantifiable increase in sedimentation and change in TDS could occur from the 899 cubic yards of annual soil loss from surface disturbance. Water quality of Indian Creek could be degraded.

Mineral exploration and development in the area would generally be confined at or near the surface or with widely spaced wells; therefore, these activities would not significantly impact ground water in most cases. However, development of potash, depending on methods used, could result in a reduction of ground water quality. There are no water wells in the area, but one undeveloped seep could be affected.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

The potential for up to 10 million barrels of oil in-place (3 million estimated recoverable) and up to 60 billion cubic feet of natural gas (18 billion estimated recoverable) exists within the WSA.

Under this alternative, these oil and gas resources could be explored and developed, subject to Category 1 stipulations. As much as 160 acres of surface disturbance would take place if exploration and development were to occur. However, due to the small size of these deposits, no development is expected under this alternative.

Potash

An estimated recoverable potash resource of between 750 thousand and 7.5 million tons could underlie all 6,780 acres of the WSA. Under this alternative, this resource could be explored and potentially developed in the future. It is estimated that up to 420 acres of surface disturbance would occur from potash development. There is little likelihood for production of potash from the WSA in the near future. There are presently no potash leases covering the WSA, and no prospecting permits have been issued for the immediate area.

Locatable Minerals

Locatable mineral development could occur within the WSA. The entire WSA would remain open to mining claim location. The potential deposit of up to 1,000 tons of uranium oxide and up to 50,000 tons of copper could be developed. Approximately 40 acres could be disturbed due to exploration and development of these locatable mineral resources. However, the likelihood of development is thought to be low to moderate because of economic considerations (e.g., transportation, potential, etc.).

WILDLIFE

Under this alternative, desert bighorn sheep may migrate into the area and become established near isolated water sources. Transplants could occur but none are currently proposed. There are no identified wildlife-related vegetation treatments or facilities planned within this WSA. However, any planned for in the future, such as water developments for bighorn sheep, could be developed without wilderness consideration. Disturbance of an estimated 620 acres (.9 percent of the WSA) through mineral and energy exploration and development would disrupt wildlife. Desert bighorn sheep, deer, cottontail rabbit, and mobile nongame animals would be dispersed from the disturbed area for the lifetime of these activities. Less mobile wildlife would either perish or co-exist with these disturbances at smaller and less viable population levels. As much as 9 percent of the crucial yearlong desert bighorn sheep habitat could be destroyed during the time of development. Rehabilitation could eventually restore habitat. No threatened, endangered, or sensitive species would be affected because none inhabit the WSA.

FOREST RESOURCES

Since there are few trees other than scattered pinyon and juniper, none of which are utilized (except possibly by occasional campers or hikers), and since minimal surface-disturbing activities are anticipated, no loss or harvest of forest resources is expected under this alternative.

LIVESTOCK

Domestic livestock grazing would continue as authorized in the current BLM planning document. The two operators with cattle use could continue to use the estimated 39 AUMs currently allocated within the WSA. The existing gap fence could be maintained as in the past. No rangeland developments are currently proposed in the WSA. Additional roads or other facilities for livestock handling could be proposed and developed in the future without regard for wilderness values. No motorized vehicles are currently being used to manage livestock in the WSA and probably would not be used in the future. Few, if any, changes in livestock management techniques are expected. Livestock forage would temporarily be reduced by as much as 36 percent from mineral and energy related disturbance. However, less than 1 percent of the two allotments that are affected are in the WSA, so the impact would be insignificant to livestock operations.

VISUAL RESOURCES

Under this alternative 620 acres of mineral-related exploration and development are possible. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. VRM Class II objectives would probably not be met in the disturbed areas during the short term. Even after rehabilitation, some permanent localized degradation would be expected. If roads, vehicular ways, and drill pads are located throughout the area (worst-case analysis), visual quality could be significantly reduced in the WSA as a whole.

CULTURAL RESOURCES

Disturbance of 620 acres by mineral and energy exploration and development under this alternative could result in inadvertent damage or loss to cultural resources (100 potential sites, 16 of which are potentially National Register eligible). However, inventories for the purposes of site recordation and mitigation would take place prior to any surface disturbance and would mitigate impacts. The overall effect on cultural resources is expected to be minimal. Vandalism could be a problem due to increased access from mineral

and energy exploration and an increase in recreational use of the area resulting from the general population increase.

RECREATION

The quality of a user's primitive recreational experience would be reduced by surface-disturbing activities. Under this alternative, mineral and energy related exploration and development are possible on 620 acres. If roads, vehicular ways, and drill pads are located throughout the WSA (worst-case analysis), primitive recreation opportunities could be lost in the area altogether. However, roads and ways created for mineral and energy exploration and development would improve access into the area for nonprimitive recreation.

The future trends in recreational use of the WSA are unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate, overall recreational use (almost entirely primitive or nonmotorized) is expected to increase from 100 current visitor days per year to 149 visitor days at the end of 20 years. No ORV use is currently taking place in the WSA; however, the WSA would continue to be open to ORV use, and motorized activities would be in conflict with nonmotorized uses where their areas of use overlap.

WILDERNESS VALUES

None of the area would be designated wilderness, and management would be under the existing Indian Creek-Dry Valley MFP until superseded by the San Juan RMP.

Under this alternative, 620 acres of mineral and energy exploration and development are possible. The related surface disturbance would result in a significant loss of naturalness and outstanding opportunities for solitude and primitive, unconfined recreation throughout the WSA as a whole if roads, vehicular ways, and drill pads are located throughout the area. The potential for mineral development and related disturbance is low to moderate in this WSA.

On the 6,780 acres, outstanding opportunities for solitude and primitive, unconfined recreation could be lost due not only to surface-disturbing activities, but allowance of motorized uses. Due to inaccessibility, wilderness values would remain in some portions of the WSA.

LAND USE PLANS AND CONTROLS

This alternative would be consistent with the *San Juan County Master Plan* because existing uses would continue. There would be no conflict with the current zoning. This alternative would not be consistent with potential wilderness management of adjacent NPS-proposed wilderness. While nondesignation would not affect potential NPS wilderness designation, impacts caused by mineral exploration and development could interfere with the wilderness experience on the adjacent National Park lands. This alternative would be consistent with State of Utah policies to emphasize economic return. It would also be consistent with the existing Indian Creek-Dry Valley MFP and forthcoming San Juan RMP because existing uses would continue.

SOCIOECONOMICS

Under this alternative, no changes are expected in existing patterns and trends of population, employment, and local income distributions. Economic development of resources in the WSA would not be affected. There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the oil and gas, potash, uranium/vanadium, and copper in the WSA were developed it would increase employment and income for San Juan County. However, the probability of economic development of minerals within the WSA is only low to moderate (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the existing grazing use (39 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to be approximately 149 visitor days per year in 20 years and overall recreation-related expenditures average only $4.10 per visitor day (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA would not be significant to the local economy.

Federal and State revenues would not be reduced by this alternative. All 6,870 acres in the WSA are under oil and gas leases. Generation of up to

$20,610 per year in Federal oil and gas lease revenues within the WSA would continue. Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees (currently $55 per year) would continue. About 50 percent of the revenues would be returned to the local BLM office for use in range improvement projects.

Overall, the local economic impact would be considered insignificant.

All Wilderness Alternative (6,870 Acres) (Proposed Action)

As identified in the Description of the Alternatives section, the major changes that could occur in the 6,870-acre area would be related to its withdrawal from mineral location and closure to new mineral leasing and sale. The entire area would be placed in leasing Category 4 (closed to leasing). The entire area would be closed to vehicular use except for approvals by BLM, as discussed in the Description of the Alternatives section. The WSA would be managed under VRM Class I.

For the following analysis it is assumed that the existing mining claims would eventually be explored and developed, causing an estimated 40 acres of disturbance within the WSA. (Appendix 10 lists surface disturbance assumptions and estimates for the WSA.) It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing of oil and gas or other leasable minerals would not be allowed. It is also assumed that potash (currently no leases) would not be developed because there would not be an opportunity for leasing.

Because potentially disturbed areas would be smaller than under the No Action Alternative (40 vs. 620 acres), the impacts from development and surface disturbance on air quality, geology, livestock, and forest resources would be insignificant. Wilderness designation wou1d provide additional protection to these resources as compared to the No Action Alternative because it would reduce potential for disturbance. Other effects on these resources due to changes in management are discussed below.

SOILS

It is estimated that up to 40 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.35 cubic yard/acre/year. Where the surface is disturbed, soil erosion would increase to approximately 1.80 cubic yards/acre/year. Soil loss on the 40 acres would increase from 14 cubic yards/year to 72 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 58 cubic yards (2.4 percent) over the current annual soil loss of 2,438 cubic yards/acre. This is 841 cubic yards less than under the No Action Alternative.

WATER RESOURCES

Opportunities for watershed improvements could be limited because wilderness protection criteria must be met. No improvements are currently planned. Wilderness designation would protect the good water quality of Indian Creek and one seep known to exist in the WSA, because the potential for erosion and resulting loss of water quality would be reduced. Also, potash development with the potential for degrading ground water quality would not occur under this alternative.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

All 6,870 acres of the WSA (4,470 acres pre-FLPMA and 2,400 acres post-FLPMA) are under oil and gas leases. However, no exploration or development of oil and gas is presently occurring within the WSA.

Existing pre- and post-FLPMA leases could be developed subject to the stipulations issed at the time of leasing. It is unlikely that existing leases will be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases will not be reissued.

Exploration for and development of a potential resource of up to 10 million barrels of oil and less than 60 billion cubic feet of natural gas with 3 million barrels of oil and 18 billion cubic feet of natural gas considered recoverable could be foregone under this alternative. However, due to the small size of the potential deposits, the low certainty that these exist, and the low likelihood of exploration and development activities even without wilderness designation, it is concluded that this alternative would not result in any significant loss of potential oil and gas recovery.

Potash

Potash potential is rated as moderate (between 1 million and 10 million tons with 750 thousand to 7.5 million tons considered recoverable). There

are currently no potash leases or prospecting permits in the area. Therefore, the opportunity to recover the potash resource would be foregone under this alternative. The WSA (all 6,870 acres) lies on the thinner edge of the potash-bearing zone, where development would be least likely. It is unlikely that the resource would be developed even without wilderness designation.

Locatable Minerals

Approximately 320 acres are under 18 post-FLPMA mining claims within the WSA. The WSA has been rated as having moderate favorability for uranium/vanadium and low favorability for copper. Up to 1,000 tons of uranium oxide and up to 50,000 tons of associated copper could occur with the WSA. Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation under unnecessary or undue degradation guidelines with consideration given to protecting wilderness values. If minerals are located prior to wilderness designation, it is estimated that up to 40 acres could be disturbed due to exploration and development of locatable mineral resources. The worst-case impact to minerals would occur if the potentially recoverable minerals are not within mining claims filed prior to designation. In that case, the potential for recovery of uranium/vanadium and copper resources within the WSA would be foregone. Vanadium and copper are on the National Defense Stockpile Inventory of Strategic and Critical Minerals.

Because production of these metals is not currently occurring and because current economic considerations (e.g., transportation, low to moderate potential, etc.) are unfavorable, the likelihood that exploration or development would occur even without wilderness designation is only low to moderate.

WILDLIFE

Under this alternative, wildlife would benefit due to the preservation of solitude. Wilderness designation would protect the 6,870 acres of crucial yearlong desert bighorn sheep habitat. There are no identified wildlife-related vegetation treatments or facilities planned within the WSA.

Disturbance of 40 acres due to exploration of locatable mineral resources could disrupt wildlife populations and result in mobile species leaving these areas. However, impacts are not expected to be significant due to the small amount of disturbance that is projected to occur under this alternative.

No threatened, endangered, or sensitive species would be affected because none are present within the WSA.

LIVESTOCK

Present domestic livestock grazing would continue as authorized in the Indian Creek-Dry Valley MFP. The 39 AUMs currently allocated in the WSA are controlled by two livestock (cattle) operators.

The gap fence would be maintained as in the past, based on practical necessity and reasonableness. New rangeland improvements would be allowed if determined necessary for the purposes of rangeland and/or wilderness protection and the effective management of these resources. However, future roads or other livestock management facilities could be restricted to preserve wilderness values.

Since no use of motorized vehicles is currently taking place to manage livestock, and no rangeland improvements, including land treatments, are currently planned for this WSA, little effect on the management of livestock grazing is expected.

VISUAL RESOURCES

Wilderness designation would contribute to the preservation of the area's visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through ORV closure, and through closure of the entire area to future mineral leasing and location.

Under this alternative, mineral-related surface disturbance would be reduced from 620 acres to 40 acres, associated with development of valid mining claims. Although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation, some permanent localized degradation could be expected.

Because the potential for development of mining claims is low and wilderness designation would reduce the potential for surface disturbance, visual quality would probably not be reduced in the WSA as a whole.

CULTURAL RESOURCES

Approximately 40 acres (0.58 percent of WSA) could be disturbed by mineral exploration and development; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any and all pro-

posed surface disturbance and would mitigate any adverse impacts. Inadvertent loss or damage to cultural resources could occur; however, these impacts are expected to be minimal.

There is potential for increased vandalism to cultural resources due to increased recreational use of the WSA. However, protection afforded by wilderness management would outweigh any potential vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

Although use is currently low (about 100 visitor days a year), the WSA has outstanding primitive recreational values. If designated, those high quality recreational opportunities would be recognized, managed, and protected.

As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an increase in primitive recreational use above the baseline rate. Judging from use densities of a number of well known wilderness areas, proposed wilderness areas, and primitive areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites, it is estimated that, following designation, use could be as much as 344 visitor days per year (USDI, BLM, 1985). This is 244 visitor days over the area's current estimated 100 annual visitor days. Management provided through a Wilderness Management Plan would control destructive increases in future recreation use, and the quality of the primitive recreation experience probably would not be negatively affected by the increased use.

Mineral-related surface disturbance on up to 40 acres could cause localized impairment of recreational values. Because the potential for mineral production is only low to moderate and wilderness designation would reduce the potential for surface disturbance, the quality of the primitive recreational experience would likely be preserved throughout the area as a whole.

Little impact on ORV recreational use from the ORV closure would be expected due to the lack of such activity in the area. The ORV closure would eliminate the potential for conflicts with nonmotorized recreationists.

It is concluded that this alternative would benefit recreation by reducing the likelihood for surface-disturbing activities and increasing management's recognition of the area's primitive recreational values.

WILDERNESS VALUES

Designation and management of all 6,870 acres as wilderness would contribute to the preservation of the wilderness values of size, naturalness, and outstanding opportunities for solitude and primitive, unconfined recreation contained throughout the entire WSA. The special features in this WSA (i.e., unspoiled desert landscapes, pouroffs, and cultural resources) would also be protected and preserved.

Increased recreational use could decrease opportunities for solitude because of the limited number of canyons and limited access points that would tend to concentrate recreational activities; however, adjacent NPS lands would help disperse use. Therefore, no significant effect on solitude and primitive recreational values would be expected.

Wilderness designation would contribute to the preservation of the area's wilderness values. Under this alternative, the potential for surface-disturbing activities that could impair wilderness values would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through an ORV closure, and through closure of the entire area to future mineral leasing and location.

No development of leases is foreseen under this alternative. The possible mineral-related surface disturbance would, therefore, be reduced from 620 acres to 40 acres for development of valid mining claims. Mitigation to protect wilderness values would be considered during mining claim development, but road construction and use of motorized equipment could be allowed for development of valid mining claims if there are no reasonable alternatives. There are 320 acres (4.6 percent of the WSA) under mining claims and potential for mineral development is low to moderate. Mineral-related disturbance, including access roads, would eliminate naturalness and the opportunities for solitude and primitive, unconfined recreation on the affected areas. However, because possible mineral-related disturbance would be reduced and mitigation would be imposed to protect wilderness values, loss of wilderness values in the area as a whole after designation would be much less likely than if the area were not designated wilderness.

Designation of the WSA as wilderness would benefit the wilderness values and uses of the contigtiguous NPS lands.

LAND USE PLANS AND CONTROLS

The *San Juan County Master Plan* emphasizes multiple use for public lands and zones this area for open range and forest land. This alternative would not totally conflict with the County's multiple-use concept since many existing resource uses would continue, although under more restrictive conditions. This alternative would conflict with the County's multiple-use concept where restrictive conditions would be placed on mineral development and oil and gas leases would be phased out.

The Indian Creek-Dry Valley MFP does recommend the area be reviewed for possible wilderness designation. However, the determination to designate or not designate Indian Creek WSA as wilderness will not be discussed in the BLM planning documents, and Congressional designation would be an amendment to the MFP or to the San Juan RMP scheduled for completion in 1986.

A wilderness recommendation would complement the proposed adjacent wilderness area in Canyonlands National Park. There are no State lands within the WSA; thus, wilderness designation would not conflict with the policy of the State of Utah to maximize economic returns.

SOCIOECONOMICS

Overall there would not be significant changes in current trends of population, employment, and local income distribution.

Because of restrictions placed on the use of resources under wilderness designation there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 8).

The potential for mineral development in the WSA is low to moderate (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Valid existing oil and gas leases and mining claims could be developed, but designation would preclude new leases and claims from being established in the WSA. Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they could be with mineral development under the No Action Alternative. Because the potential for mineral development is low to moderate, it is estimated that potential mineral-related local income would not be significantly reduced by wilderness designation. However, any local income related to assessment of future mining claims would be lost.

Livestock use and ranchers' income would continue as at present with $780 of livestock sales and $195 of ranchers' return to labor and investment. Potential improvements for livestock could be foregone along with any resulting increase in ranchers' income. No such potential range improvements have been proposed.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section). Related local expenditures would be small (average of $4.10 per visitor day statewide).

The loss of leases on 6,870 acres would cause an eventual loss of up to $20,610 per year of lease fees to the Federal Treasury.

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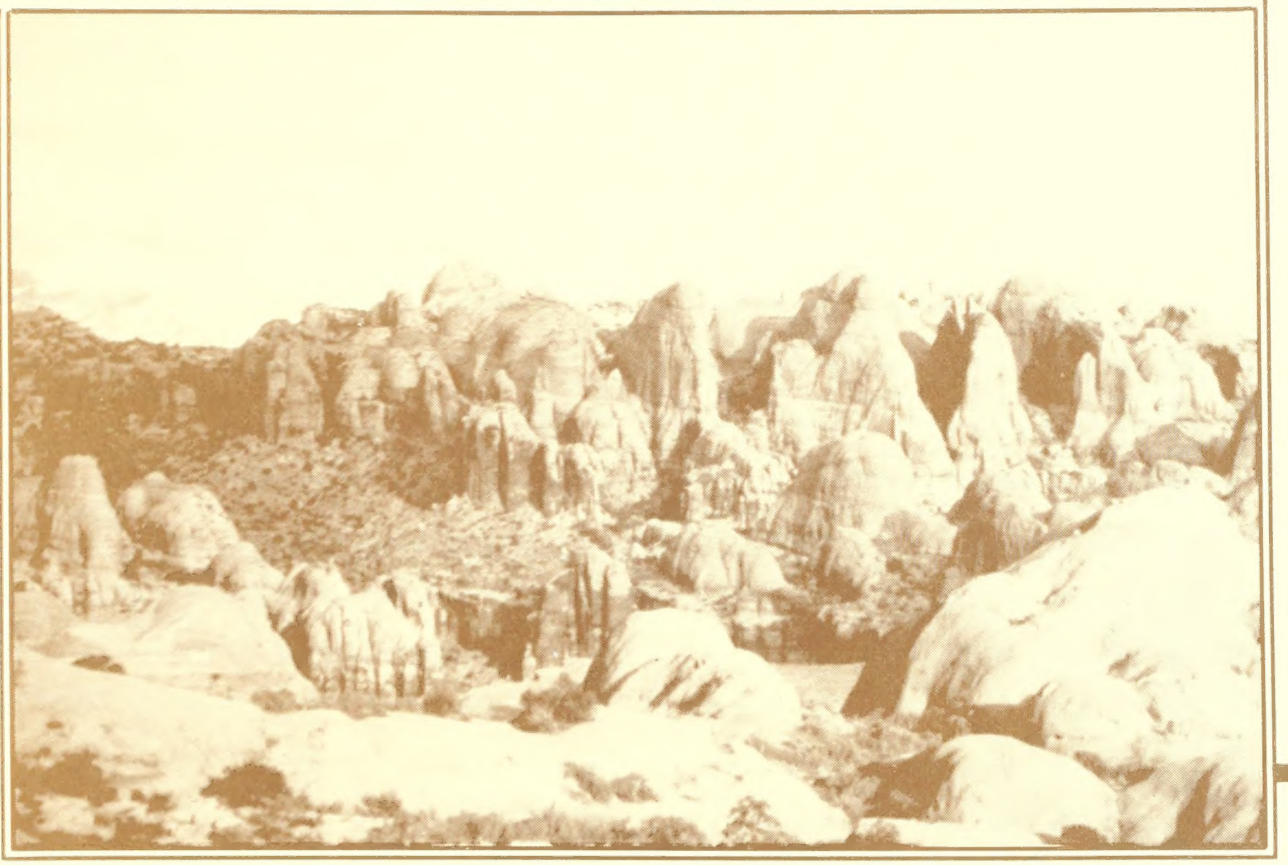
Behind the Rocks WSA



BEHIND THE ROCKS WSA

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BEHIND THE ROCKS WSA
(UT-060-140A)

INTRODUCTION

General Description of the Area

Behind the Rocks Wilderness Study Area (WSA) lies immediately southwest of Moab, Utah. The Colorado River lies just north of the WSA. The WSA generally parallels the Moab Rim cliffline southwest of the town. It is about 11 miles long, northwest to southeast, from 0.5 to 3 miles wide, and contains approximately 12,635 acres of BLM-administered land. Of this total, 6,800 acres lie in Grand County and 5,835 acres in San Juan County. In addition, within the boundary of the WSA are 640 acres of State lands and 135 acres of split estate lands (Federal surface, State minerals). The WSA was originally reported as having 12,930 acres; the difference is attributable to Master Title Plat checks and a minor realignment of the southern boundary based on the naturalness criterion.

The climate is semiarid and characterized by very hot summers and moderately cold winters. Annual temperatures range from 120 degrees Farenheit (F) to -10 degrees F. Average annual precipitation ranges from approximately 6 to 11 inches; half of that falls during the growing season. Most precipitation occurs as late summer thunderstorms. Average annual snowfall is between 10 and 20 inches.

The WSA is bordered on the south by Hunters Canyon, on the west by the Pritchett Canyon jeep road, on the north by a powerline right-of-way south of the Colorado River and a part of the Moab Rim jeep trail, and along the northeast by the Moab Rim cliffline. The WSA is characterized by striking red Navajo Sandstone formations which form a series of closely packed slickrock ridges, or fins, up to 500 feet high running across the northern third and eastern edge of the WSA. These have been carved by wind and water to form arches, alcoves, potholes, and spires. Vegetation occurrence is limited due to the high percentage of rock outcrop and is composed of stunted juniper trees, grasses, and desert shrubs.

Specific Issues Identified in Scoping

General issues pertaining to the WSAs in the Grand Resource Area are discussed in Volume I. Several concerns pertaining the the wilderness study process and/or the environmental analysis process were raised during scoping. These concerns are discussed in the Scoping section of Volume I rather than in the individual analyses of WSAs. Five specific issues pertaining to the Behind the Rocks WSA were identified through formal public scoping (USDI, BLM, 1984) and are responded to below:

1. *Comment:* The Environmental Impact Statement (EIS) should analyze sediment control in the WSA.

   Response: Within the Description of the Alternatives section of this document each alternative is presented with a description of the actions likely to take place. Under the All Wilderness Alternative, water resource facilities would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President. Water resource facilities are also allowed under the No Action Alternative. However, no water developments or sediment control projects have been planned for this WSA because most of the erosion is natural and could not be controlled by structures or other control methods.

2. *Comment:* The occurrence of the the sensitive plant species *Lomatium latilobum* and *Cryptantha johnstonii* in or near this WSA should be considered in the decisionmaking process.

   Response: These two species have not been identified as occurring in or near the WSA. Thus, they have not been considered in the analysis. Three other species under consideration for threatened or endangered status by the Fish and Wildlife Service (FWS) are identified near and may occur within the WSA, and thus are considered in the analysis.

3. *Comment:* Does this area have oil and gas potential?

4. *Comment:* The WSA encompasses the Moab oil and gas prospect. This prospect is a

structural trap with rocks of Mississippian Age and a very high potential for oil and gas as the main objective.

Response: The WSA falls within the Paradox Basin which is considered favorable for oil and gas production. It is not known, however, if oil and gas exist under the WSA. All but one of 12 holes drilled around the WSA have been dry. Extremely rugged surfaces within the WSA have discouraged drilling, especially when more feasible areas are located nearby. The WSA has been rated as having a moderate potential for oil and gas with 10 to 50 million barrels of oil or 60 to 300 billion cubic feet of natural gas in-place.

5. *Comment:* The oil and gas (mineral) potential of the WSA is ranked moderate by Science Applications, Inc. (SAI, 1982). Based on proprietary information, representatives of the oil and gas industry believe the potential of the WSA to be high. This information should be considered in the Draft EIS.

Response: At this time BLM has not made an independent assessment of geologic information gathered by oil and gas companies. The SAI (1982) report will be used as the reference on oil and gas potential for this EIS, but information provided by the oil and gas industry and available mineral investigation reports by the USDI, Geological Survey and Bureau of Mines will be reviewed by BLM prior to making final wilderness recommendations to the Secretary of the Interior. Also, refer to the response to Comment 4.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated From Detailed Study

No alternatives were identified for this WSA during scoping other than those analyzed. A Partial Wilderness Alternative was not developed for this WSA because wilderness quality is uniform throughout, and there appear to be no manageability problems or resource conflicts that would be resolved through such an additional alternative.

Alternatives Analyzed

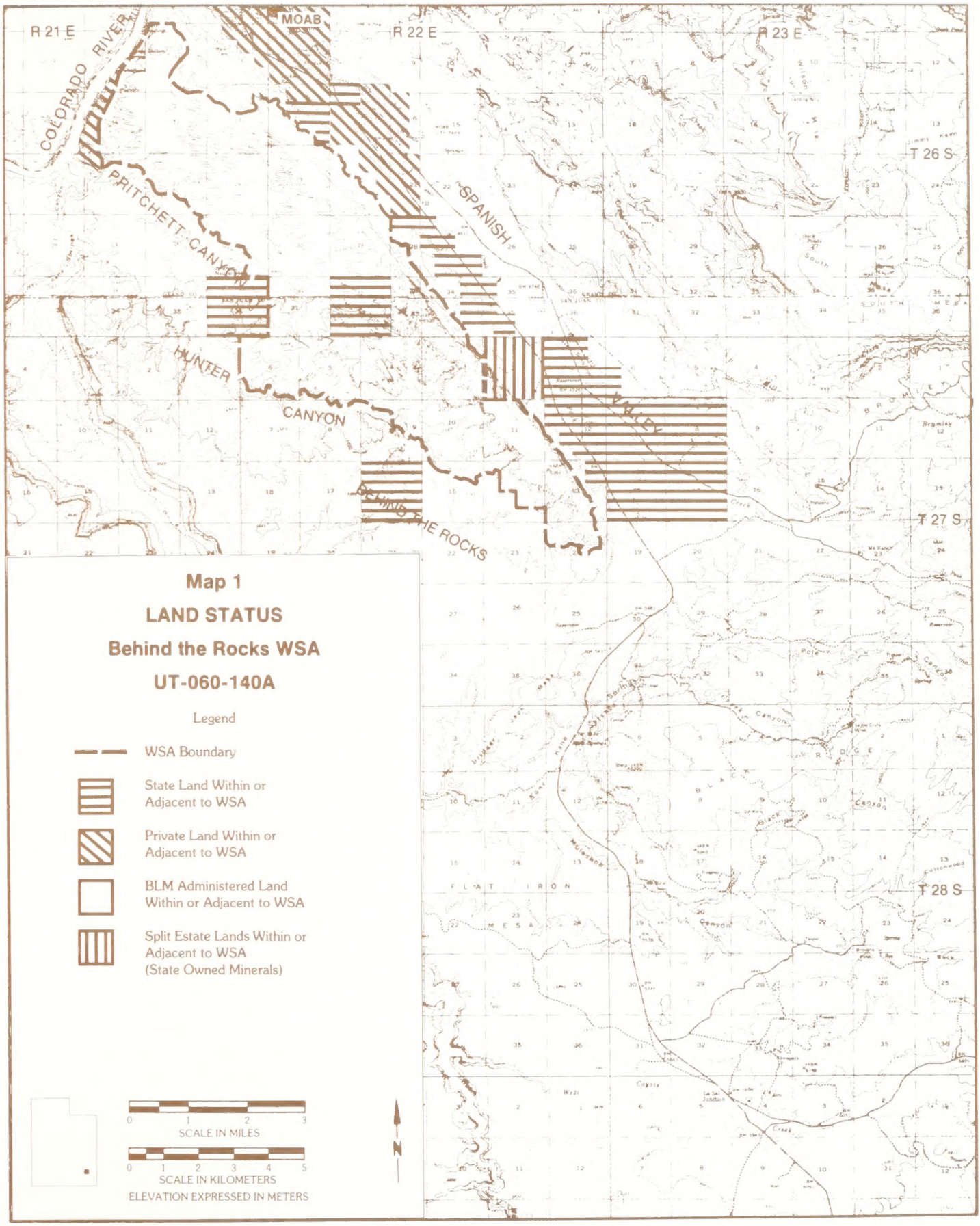
Two alternatives are analyzed for this WSA: (1) No Action; and (2) All Wilderness (12,635 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 12,635-acre Behind the Rocks WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the Grand Resource Area Resource Management Plan (RMP) (USDI, BLM, 1983). Neither the one section (640 acres) of State land nor the 135 acres of split estate lands with State minerals that are within the WSA (refer to Map 1) have been identified in the RMP for special Federal acquisition through exchange or purchase. State in-holdings are analyzed as remaining under State ownership.

The following are specific actions that would take place under this alternative:

- All 12,635 acres would remain open to mineral location and to mineral sale. Development work, extraction, and patenting would be allowed on 154 existing mining claims (2,680 acres) and potential future mining claims should they be determined valid. Development would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809), without consideration for wilderness values. Existing oil and gas leases (7,140 acres) could be developed under Category 1 (standard stipulations) without concern for wilderness values. New leasing in unleased areas or in areas where existing leases expire in the area of the WSA would be managed in oil and gas leasing Category 1 (standard stipulations), 3,325 acres; Category 2 (special stipulations), 260 acres; Category 3 (no surface occupancy), 4,770 acres; and Category 4 (no leasing) on 4,280 acres.
- Domestic livestock grazing use of the WSA would continue as authorized in the RMP (currently 160 Animal Unit Months [AUMs]). Grazing use would continue to be limited along the northeastern edge of the WSA because of rugged terrain. New rangeland developments could be implemented without wilderness considerations; however, none exist or are planned.
- Use, maintenance, and development of facilities and improvements for wildlife, water


R 21 E
MOAB
R 22 E
R 23 E
COLORADO RIVER
PRITCHETT CANYON
SPANISH
T 26 S
HUNTER
CANYON
BEHIND THE ROCKS
T 27 S
T 28 S
Map 1
LAND STATUS
Behind the Rocks WSA
UT-060-140A
Legend
WSA Boundary
State Land Within or Adjacent to WSA
Private Land Within or Adjacent to WSA
BLM Administered Land Within or Adjacent to WSA
Split Estate Lands Within or Adjacent to WSA (State Owned Minerals)
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N

resources, etc. could be allowed if in conformance with the RMP. One spring development and about .3 mile of water pipeline are within the WSA.

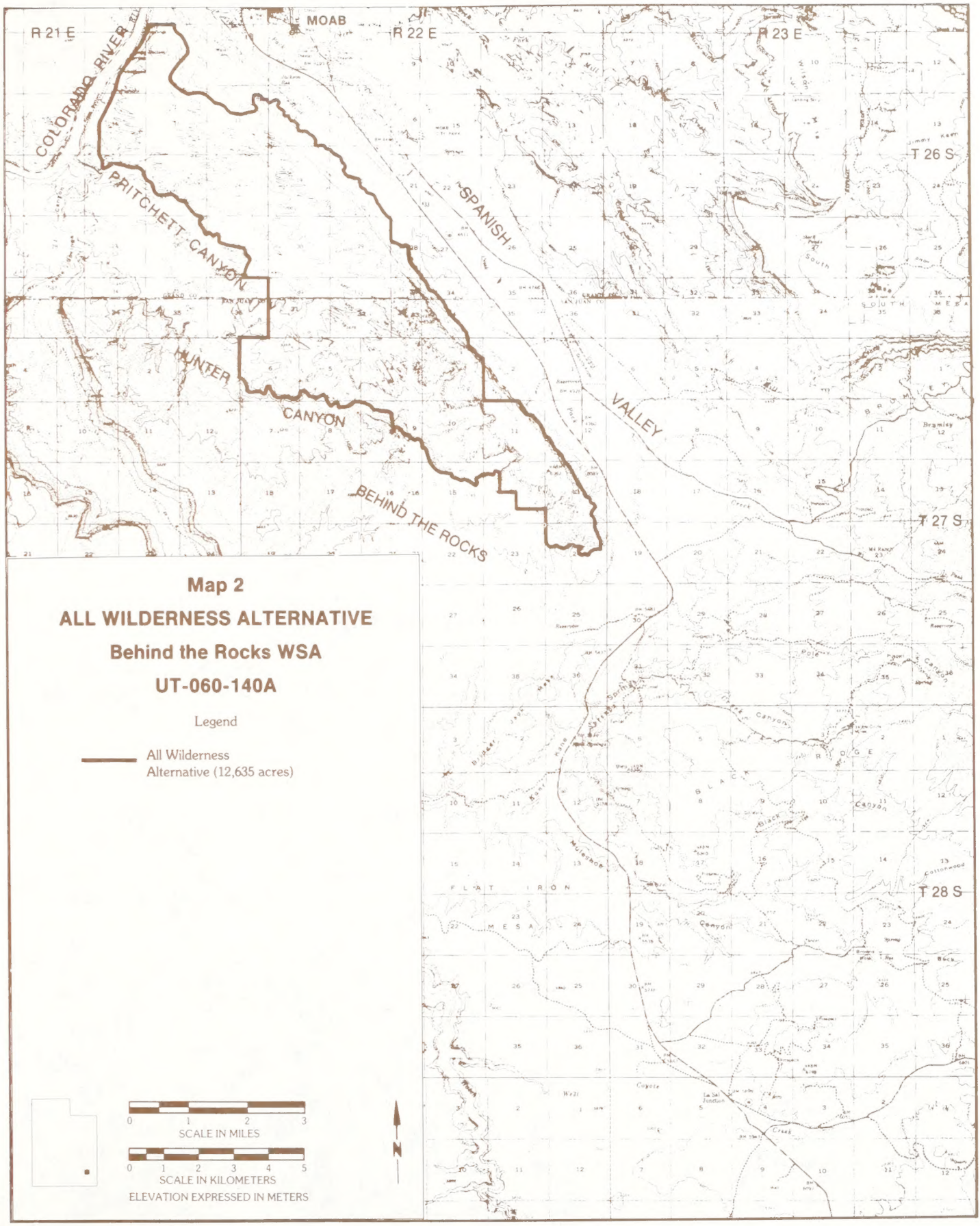
- The entire WSA acreage would be closed to off-road vehicle (ORV) use per decisions documented in the Grand RMP. This designation would not apply to the road in Pritchett Canyon that borders the WSA.
- The entire area would be open to woodland product harvest; however, opportunity is limited. There is no harvest of forest products at the present time, nor is any planned.
- The entire 12,635-acre area would continue to be managed under Visual Resource Management (VRM) Class II.
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under this alternative, all 12,635 acres of the Behind the Rocks WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). The area would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. It is assumed that, upon designation, BLM would acquire through purchase or exchange all State in-holdings (refer to Map 1) including 640 acres of State lands and 135 acres of split estate lands with State minerals. Two State sections (one with split estate State minerals only) adjacent to the WSA likely would be exchanged. Refer to Volume I for a further discussion of State land. Should land transfers be made, it is assumed that management and types of impacts to former State in-holdings would be the same as those on adjacent Federal lands and no specific analysis is given here. The figures and acreages given under this alternative are for Federal lands only. No private lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 12,635 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the approximately 2,680 acres of existing mining claims that may be determined to be valid. Development would be regulated by unnecessary or undue degradation guidelines with consideration given to wilderness values. Existing oil and gas leases involving about 7,140 acres would be phased out uipon expiration unless a find of oil or gas in commercial quantities is shown. New oil and gas leaes would not be issued.
- Present domestic livestock grazing would continue as authorized in the Grand RMP. The 160 AUMs in the WSA would remain available to livestock as presently allotted. After designation, new rangeland developments (there are none existing) would be allowed on a case-by-case basis if necessary for resource protection (rangeland and/or wilderness) and the effective management of these resources, subject to wilderness protection criteria (refer to Appendix 1). No rangeland developments are currently planned within the area.
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities are planned.
- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values. Currently, there are no wildlife developments in the WSA, and none are planned.
- The entire 12,635-acre area would be closed to ORV use except for: (1) users


R 21 E
MOAB
R 22 E
R 23 E
COLORADO RIVER
PRITCHETT CANYON
SPANISH
HUNTER
CANYON
VALLEY
BEHIND THE ROCKS
T 26 S
T 27 S
T 28 S
Map 2
ALL WILDERNESS ALTERNATIVE
Behind the Rocks WSA
UT-060-140A
Legend
All Wilderness Alternative (12,635 acres)
0 1 2 3
SCALE IN MILES
0 1 2 3 4 5
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N

with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) occasional and short-term vehicular access approved by BLM for livestock maintenance. Various vehicle ways, totaling 3.55 miles, extend short distances into the WSA and would be closed. About 15 miles of roads and jeep trails that border the WSA in Pritchett Canyon and along the Moab Rim would remain open to vehicles.

- A specific Wilderness Management Plan would be developed to govern use and protection of the 12,635-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products at the present time, nor is any specifically planned.
- Visual resources in the WSA would be managed in accordance with VRM Class I standards which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter or disturb the landscape). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to provide a comparison of the alternatives.

AFFECTED ENVIRONMENT

Unless otherwise indicated, information for this section was taken from the Grand Resource Area RMP, and other BLM technical reports and documents.

Air Quality

The WSA has a Prevention of Significant Deterioration (PSD) Class II air quality classification (1977 Clean Air Act amendments). Arches and Canyonlands National Parks are nearby Class I areas. Arches is only 3 miles north of the WSA. Prevailing winds are from the west-southwest.

Visibility, both looking in and from the WSA, is an important value. Visibility in the WSA is good with few pollutants. The WSA can be seen from many high-use areas including Moab, the La Sal Mountains, Arches and Canyonlands National Park, Dead Horse Point State Park, Anticline Overlook on Hatch Point (BLM), and U.S. Highway 191. The WSA provides panoramic vistas of Moab and Spanish Valley, the Colorado River, Canyonlands and Arches National Parks, the La Sal Mountains, the Book Cliffs, and the areas to the northwest.

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
BEHIND THE ROCKS WSA

Resource	Alternatives	
	No Action	All Wilderness (12,635 Acres) (Proposed Action)
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 to 15 million barrels of oil, 18 to 90 billion cubic feet of natural gas, 75,000 to 7.5 million tons of potash, and 500 to 1,000 tons of uranium oxide.	Oil, gas, and potash likely would not be recovered. Assuming a worst-case analysis, uranium recoverable would also be foregone. Due to the low likelihood of recovery of these mineral resources, however, the loss of development opportunity would not be significant.
Wildlife	About 6 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.
Livestock	Grazing of 160 AUMs would continue. There are no existing developments. New developments could be implemented; however, none are now proposed.	Grazing of 160 AUMs would continue. Little effect on grazing management is expected. New developments proposed in the future might not be allowed. Overall, livestock management would not be affected.
Visual Resources	The quality of visual resources could be impaired on up to 770 acres. This could reduce visual quality throughout the WSA.	Visual quality could be impaired on up to 40 acres.
Recreation	The WSA, including 3.55 miles of ways, would be closed to ORV use, in accordance with the Grand RMP. Overall recreational use could increase from the present 100 visitor days per year to 150 over the next 20 years. Up to 770 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including 3.55 miles of ways, would be closed to ORV use. Primitive recreational use could increase by 3,691 visitor days per year due to publicity associated with wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 770 acres (6 percent of the WSA). This could reduce wilderness values throughout the WSA.	Wilderness values would be protected, except on up to 40 acres (0.3 percent of the WSA) which may be disturbed by development of valid mineral rights. Overall, wilderness values would be preserved.
Land Use Plans and Controls	This alternative would be consistent with the *Grand* and *San Juan County Master Plans,* and State of Utah plans and policies. It would be in conformance with the current BLM Grand RMP.	This alternative would not be consistent with Grand and San Juan Counties' concept of multiple use. It would be consistent with State policy if lands were exchanged. Designation would constitute an amendment of the BLM Grand RMP.
Socio-economics	Annual local sales of less than $19,010 and Federal revenues of up to $21,644 would continue. An additional $3,645 per year in Federal revenues could be derived from leasing of presently unleased areas.	Annual local sales of less than $19,010 and Federal revenues of up to $224 would continue, but Federal revenues of up to $25,065 from oil and gas leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA. Increased visitation following wilderness designation could increase local sales by a small amount that would not be significant to the local economy.

Visual range in this portion of Utah averages between 100 and 132 miles during the summer (Aerocomp, Inc., 1984).

Occasionally, there is a smog problem in the Moab Valley that could adversely affect views from the WSA, although the WSA itself is not affected because of its elevation and the barrier effect of the Moab Rim. Generally occurring during winter thermal inversions, sources of smog are reported to be the Atlas Uranium Mill north of town and wood stoves used for home heating in Moab. The smog sometimes lasts for several days. When it dissipates it generally drains north over Arches National Park. The problem appears to have worsened in recent years because of the increased popularity of wood stoves for home heating.

Geology

The entire WSA is characterized by slickrock fins cut by wide, dry washes. The massive red sandstone fins are parallel to one another, running generally in an east-west direction across the WSA.

The Behind the Rocks WSA falls on the western flank of a large anticline. The structure dips sharply to the west, contributing to erosional action on the WSA. The crest of the anticline is collapsed between two parallel faults forming the Moab Valley. The Moab Rim cliffline defines the southwestern edge of the valley and also forms the northeast boundary of the WSA.

Physiographically, the WSA falls in the Canyonlands Section of the Colorado Plateau Province. Elevations in the WSA range from 6,530 feet atop the Moab Rim (a 1,000- to 1,800-foot-high cliff) to 4,100 feet where Pritchett Canyon leaves the WSA at the northwest corner. Several drainages have cut short, wide canyons running west across the WSA to Hunters Canyon and Pritchett Canyon. A topographic feature on the northeastern edge of the WSA is a hidden valley extending along the Moab Rim above the Moab Valley.

The unique scenic quality of the WSA is directly related to the surface geology. Surface strata are Navajo and Kayenta sandstones. The Navajo has split apart vertically along parallel joint systems and weathered into massive fins some 100 to 500 feet high, 50 to 200 feet wide, and up to 0.5 mile long. The fins are closely spaced, sometimes just a few feet apart. Arches, alcoves, and potholes have formed in the fins. The fins are similar to but more pronounced than fin areas on the east side of the Moab Valley or the northeast part of the Arches National Park. The Kayenta, a ledgy sandstone, is exposed where drainages have worn through the Navajo in the southern and central portions of the WSA. The underlying Wingate Sandstone is exposed along the Moab Rim; the Chinle slope is outside the WSA.

The WSA is underlain by pre-Cambrian basement rock, found at depths of about 12,000 to 15,000 feet. Above this rests a Cambrian unit consisting of Ignacio quartzite and Lynch dolomite, with a thickness of 500 to 900 feet. Resting unconformably above the Cambrian strata are Devonian sandstones and limestones, with a thickness of 150 to 250 feet. Above the Devonian is a sequence of Mississippian Age limestone referred to as the Redwall Limestone, about 300 to 500 feet thick. Above the Mississippian rests a thick sequence of salts, shales, and limestones belonging to the Pennsylvanian Age Hermosa Group. The Hermosa consists of three separate formations with the basal unit consisting of a 100- to 200-foot limestone called the Pinkerton Trail Formation. Above the Pinkerton Trail rests 3,000 to 5,000 feet of evaporitic salts and interbedded shales of the Paradox Formation. The upper and last unit of the Hermosa Group consists of 1,500 to 2,000 feet of limestone and dolomite referred to as the Honaker Trail Formation. Above the Hermosa Group rests the Cutler Group which forms a thick sequence of arkosic sandstone and limestone. The basal unit consists of 500 to 800 feet of limestone known as the Elephant Canyon Formation, with the remaining Cutler strata consisting of undifferentiated arkosic sandstone 900 to 1,200 feet thick. The Cutler is overlain by a thin, shaley formation, only 100 to 150 feet thick, known as the Moenkopi. Above the Moenkopi rests the Chinle Formation, roughly 400 to 500 feet thick.

The WSA contains at least three arches formed from the Navajo fins and one formed from the Kayenta. Other arches probably exist in the WSA but have not yet been discovered. Angel Rock (the "vanishing angel") falls within the WSA along the Moab Rim; this is a spire formed from the Wingate Cliff which is a prominent landmark of the Moab Valley. A rock slab with dinosaur tracks, from the Kayenta Formation, lies on the opposite side of the Colorado River from the WSA, indicating a potential for paleontological resources within the WSA. Dinosaur fossils have also been found in the Navajo Formation across the Moab Valley from the WSA, but they are considered extremely rare.

Soils

The Behind the Rocks WSA is characterized by rock fins and slick rock. About 50 percent of the WSA is rock outcrop. About 50 percent is shallow or deep sandy soils occurring between rock fins on sloping benches.

The sandy soils are highly susceptible to wind erosion when disturbed. Table 2 describes soil characteristics and land types and Table 3 describes erosion conditions.

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year)	
			Present Condition	Bare Soil Surface
Rock outcrop	50	6,318	0	0
Shallow or deep sandy soils on sloping structural benches	50	6,317	1	5
Totals	100	12,635		

Source: Hansen, 1985.

Vegetation

Vegetation growth within the WSA is limited because of the high percentage of rock outcrop and lack of water. Vegetation is confined to areas between fins and areas of blowsand, where soils have formed.

Vegetation includes stunted juniper and pinyon and other desert species: yucca, prickly pear cactus, rabbitbrush, blackbrush, cliffrose, serviceberry, snowberry, and grasses (USDI, BLM, 1974). Although there are no riparian areas identified, an occasional cottonwood, sagebrush, and shrub willow can be found in drainage bottoms. Exotic species found within the WSA include Russian olive, tamarisk, and poison ivy; one Catalpa tree grows in Pritchett Canyon. There are no known threatened, endangered, or endemic plant species within the WSA. Three sensitive species which may occur (*Astragalus isleyi*, *Asclepias cutleri*, and *Zigadenus vaginatus*) are under consideration by the FWS for listing as threatened or endangered species. Potential acreage for these species is unknown. A few isolated hanging gardens may occur in alcoves above the Colorado River. Existing vegetation types are summarized in Table 4.

The Behind the Rocks WSA lies in the Colorado Plateau Province as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) type of the WSA is pinyon-juniper woodland. PNV is the

Table 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions			Annual Soil Loss if Disturbed		
		Percent of Area	Acres	Cubic Yards	Percent of Area	Acres	Cubic Yards
Very High	20.0	0	0	0	0	0	0
High	10.0	0	0	0	0	0	0
Medium	5.0	0	0	0	50	6,317	31,585
Low	1.0	50	6,317	6,317	0	0	0
Very Low	0.1	0	0	0	0	0	0
None	0.0	50	6,318	0	50	6,318	0
Totals		100	12,635	6,317[1]	100	12,635	[1]31,585[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: .50 under present conditions; 2.50 if disturbed.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Pinyon, blackbrush, slender wheatgrass	3,160	25
Juniper	1,895	15
Barren	7,580	50

Source: USDI, BLM, 1974.

vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

Water Resources

The WSA lies within the Colorado River Basin. No perennial streams cross the area, but two intermittent drainages, Hunters Canyon and Pritchett Canyon, lie along the southern and western boundaries. Ephemeral drainages carry runoff from the WSA to these watercourses. Throughout the area, storm runoff is impounded in natural slickrock potholes, some of which are quite deep. These potholes have not been mapped. A spring development and .3-mile-long pipeline, authorized in 1976 (pre-FLPMA [Federal Land Policy and Management Act]), were constructed in Moonflower Canyon in 1984. The right to develop under the 1976 right-of-way to provide agricultural water to private land outside the WSA was affirmed by the Interior Board of Land Appeals (IBLA).

There has not been a water inventory for the WSA. The spring in Moonflower Canyon is the only spring presently known to exist within the interior of the WSA. There are several springs and seeps located along the boundary of the WSA and the Moab Valley escarpment. These include the springs in the intermittent drainages, Kings Bottom Spring, and several unnamed springs draining into Moab Valley. No water quality or flow data are available for these springs, so the actual ground water flow paths and the magnitude and quality of the resource are not known.

Precipitation falling on the higher elevations probably is temporarily impounded within the highly weathered fracture and joint systems in this area. This water probably infiltrates slowly and flows along these zones of higher permeability. The magnitude and direction of these zones probably control the depth and direction of ground water movement. When the water encounters a deeper, less permeable geologic unit, it flows laterally to emerge as a spring or seep on the cliff faces.

Springs associated with the intermittent drainages may emerge from bedrock or may be associated with water stored in the alluvial material filling the canyon bottoms.

Ground water quality is not known but, due to the shortness of the flow paths and the absence of highly saline geologic formations, the total dissolved solids (TDS) concentrations are low. Generally, the water quality is acceptable for recreation, livestock, and agricultural uses.

The WSA drains into the Colorado River via Pritchett Canyon, except for the face of the Moab Rim. This part of the WSA drains into the Moab Valley and then to the Colorado River. Water quality of the Colorado River, especially sedimentation and salinity, is of increasing concern because of the need to protect the rights of water users downstream.

Mineral and Energy Resources

Mineral resources are not known to have been recovered from the WSA, although the WSA is underlain by strata known to be favorable for oil and gas, uranium, and potash deposits. The region of the WSA, the Paradox fold and fault belt, is a significant producer of these mineral resources. Mineral interest in the WSA can be inferred from the several mining claims and mineral leases present within it. However, these cannot be taken to imply that mineral values actually exist within the WSA. Neither sand and gravel nor building stone is known to occur within the WSA.

The BLM, in consultation with the U.S. Department of Energy, had each WSA within Utah assessed for its energy and mineral resources by SAI (1982). (Refer to Appendix 5 for a detailed description of the SAI rating system.)

The potential for mineral resources in this WSA is moderate due to a favorable geologic environment. An overall importance rating (OIR) of 3 (on a 1 to 4 scale, where 4 is equated with high mineral importance) is given for Behind the Rocks WSA. The OIR applies to between 75 and 100 percent of the tract evaluated by the U.S. DOE, which includes 19,300 acres. The energy and mineral resource rating summary is given in Table 5.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of

TABLE 5
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f3	c2	10 to 50 million barrels of oil; 60 to 300 billion cubic feet of gas
Uranium/ Vanadium	f3	c2	500 to 1,000 tons
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f1	c4	None
Copper	f2	c1	Less than 50,000 tons
Manganese	f2	c1	Approximately 2 tons
Potash	f3	c3	1 to 10 million tons

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by FLPMA. BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. The WSA could contain deposits of vanadium and copper which are currently listed as strategic and critical materials (Federal Emergency Management Agency, 1983). Although listed as strategic, copper, is relatively common, and supplies currently exceed demand.

LEASABLE MINERALS

Oil and Gas

The tract evaluated by SAI contains 19,300 acres and includes the sand flats south of the WSA. The WSA accounts for only 65 percent of this tract. The SAI rating (f3) indicates that potential exists within the tract for 10 to 50 million barrels of oil or 60 to 300 billion cubic feet of gas in-place, with 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas estimated recoverable. (Appendix 6 provides recoverability estimates.)

The potential for oil and gas within the WSA is believed to be moderate (f3) for Mississippian-aged rocks and lower for Pennsylvanian-aged rocks. The WSA falls within the Paradox Basin which is generally considered favorable for oil and gas production.

The tract evaluated contains a portion of the area south of Hunters Canyon and includes one of 12 dry holes drilled during the 1960s and 1970s. None of these are within the WSA; one is on State land. Another dry hole was drilled west of the WSA and adjacent to the evaluated tract. Six holes have been drilled northeast of the WSA; five were dry, and the other has been abandoned. The remaining three dry holes are south of the tract.

SAI has estimated that the Paradox Basin of southeastern Utah and western Colorado contains 1.2 billion barrels of undiscovered recoverable oil and 3.8 trillion cubic feet of undiscovered recoverable natural gas. Most production occurs from Pennsylvanian- and Mississippian-aged rocks, which account for roughly 90 percent of the oil and 85 percent of the gas produced in the Moab District. Oil and gas have been produced from the Pennsylvanian-aged Paradox Formation in Long Canyon, Shafer Canyon, Kane Creek, and Bartlett Flat, all roughly 3 to 10 miles west of the WSA, and from Wilson Canyon about 15 miles south. Production from Mississippian-aged strata has occurred in Lisbon Valley, 25 miles southeast of the WSA, the Big Flat area 8 to 10 miles northwest, and the Salt Wash Field 25 to 30 miles northwest of the WSA. The Big Flat was a small field that was rapidly depleted.

The best potential for occurrence is in Mississippian-aged strata. This potential is based partially on the structural similarity of the WSA to the Lisbon Valley area and partially on the proximity to past producing Mississippian reservoirs in the Big Flat area. Potential for Pennsylvanian production is lower, based on a projected thinning and the discontinuous nature of the Paradox Formation over the Moab Anticline. Also, faulting along the Moab Valley would extend into the Paradox and may have provided avenues of escape for any hydrocarbons that may have accumulated. It is not known if the faulting extended down deeper into Mississippian rocks.

It is not known whether oil and gas resources exist under the WSA. All but one of the 12 holes drilled around the WSA's perimeter have been dry. Even if reserves are present, the costs associated with access to the WSA and the extremely

rugged surface indicate that development of production facilities within the WSA would be unlikely, especially given the presence of more feasible areas nearby. Continuing interest in the WSA, however, is indicated by recent (1981-1982) seismic work and continued leasing within it.

The area of the WSA was included in the 1975 "Price District Oil and Gas Categories Environmental Analysis Report" (USDI, BLM, 1975) which established oil and gas leasing categories to protect certain resource values. The majority of the WSA has restrictions on oil and gas leasing. The southern tip of the WSA and small areas along the Moab Rim are open to leasing with standard stipulations. The central part, about one-third of the WSA, is closed to leasing with a 0.5-mile border of no surface occupancy. Small tracts along the Colorado River are open with special stipulations to protect the Colorado River floodplain and the scenic and recreational values along the river corridor. Table 6 indicates present oil and gas leasing categories within the WSA.

TABLE 6
Oil and Gas Leasing Categories

Category	Acres in WSA	Percent of WSA
1. Open with standard stipulations	3,325	26
2. Open with special stipulations	260	2
3. Open with no surface occupancy	4,770	38
4. Suspended or no lease	4,280	34
Total	12,635	100

Source: USDI, BLM, 1975.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

The WSA has portions of 16 oil and gas leases within its boundaries (11 post-FLPMA, 5 pre-FLPMA), covering 7,140 acres of the WSA. (Refer to Table 7 which summarizes oil and gas leasing data.)

TABLE 7
Oil and Gas Leasing Data

Type	Acres in WSA	Percent of WSA
Pre-FLPMA Leases	4,640	37
Post-FLPMA Leases	2,500	19
Available for Leasing Category 3	1,215	10
Not Available for Leasing Category 4	4,280	34
Total	12,635	100

Source: BLM File Data.

Potash and Coal

There are no mineral leases within or adjacent to the WSA, other than for oil and gas. Other leasable minerals produced regionally include potash and coal.

Bedded potash is found within the Paradox Formation underlying the Paradox Basin. Sylvite, a potash-bearing mineral, is mined by a solution process about 3 miles west of the WSA and is economically important to the Moab community. The WSA is underlain by these deposits, but structural deformation occurring during and after deposition have made some areas, including the WSA, only moderately favorable for potash occurrence. The potash market currently is depressed, partly because foreign supplies are cheaper. It is unlikely that new potash development would occur under present market conditions.

The SAI rating for potash (f3) indicates a potential for 1 to 10 million tons of potash resource with 75,000 to 7.5 million tons considered recoverable within the tract evaluated; the WSA represents

only 65 percent of this tract. The certainty level (c3) indicates data showing a potash-bearing formation underlying the WSA and an active potash mine nearby.

Coal has been produced about 25 miles to the north, but the WSA is considered geologically unfavorable. Cretaceous coal-bearing strata either never were deposited or have been eroded away.

LOCATABLE MINERALS

The WSA is considered moderately favorable for uranium and vanadium. A slight potential exists for other minerals.

Uranium

The Colorado Plateau in east-central Utah contains some of the largest and most important uranium deposits in the United States. SAI has estimated that about 50 percent of the nation's total uranium reserves and about 36 percent of potential uranium resources are contained in this area. In terms of past production and future potential, the Colorado Plateau around Moab is very important for uranium and vanadium. Principal uranium-bearing units locally are Jurassic-aged Morrison Formation, Triassic-aged Chinle Formation, and the Permian-aged Cutler Formation. The Morrison Formation has been removed by erosion from the WSA. The Chinle is favorable over broad areas of the Colorado Plateau, and the WSA is in the vicinity of an ancient channel system known to contain uranium-bearing sediments (the Moss Back Member of the Chinle). The structural and stratigraphic setting is similar to Lisbon Valley. The Big Indian belt of the Lisbon Valley is one of the two most important uranium-producing areas in the nation. The host rock in the Big Indian belt is the base of the Chinle and the upper part of the underlying Cutler Formation along the southwest flank of the anticline. Therefore, the WSA is considered favorable for uranium deposits containing between 500 and 1,000 tons of uranium oxide. Exploratory drilling for uranium has occurred within the WSA over the past 20 years, but no attempts at production have been made.

Because of a general lack of data and of surface outcrop, it is not known whether uranium resources actually exist under the WSA. The costs associated with access to the WSA, the extremely rugged surface, and the steepness of the dip of ore-bearing formations indicate that development of mine facilities within the WSA would be unlikely, especially given the presence of relatively high-grade deposits in more accessible areas nearby. Continuing interest in the WSA, however, is indicated by the several claim groups for which records of annual assessment work are kept current by the claimant. Parts of nine groups of lode mining claims and one placer claim fall within the WSA, predominantly in the northwestern third. It can be assumed that the lode claims are for uranium and the placer claim for gold. In all, 154 claims are partly or entirely within the WSA, totalling approximately 2,680 acres (21 percent of the WSA). All are pre-FLPMA, and all but seven (80 acres) appear to be current in assessment work. Claims not current in assessment work or that did not meet certain other statutory requirements would be invalid. A valid mining claim exists indefinitely, so long as statutory assessment work is completed annually.

Copper, Manganese, Gold, and Silver

Other locatable minerals produced regionally include copper, manganese, gold, and silver. The WSA is considered geologically unfavorable for these. Localized copper deposits have been mined from the Kayenta but do not appear to be present within the WSA. If present copper would be in a deposit of less than 50,000 tons. Localized manganese deposits have been found randomly in Jurassic-aged Morrison and Summerville Formations, but none are known in the WSA. Gold and silver are commonly found in placer deposits along streams, but drainage patterns (both modern and geologic) within the WSA have been highly unfavorable for this type of deposition.

Wildlife

The area provides habitat for a variety of wildlife species (USDI, BLM, 1974). Mule deer, coyote, bobcat, cottontail rabbit, chukar partridge (an exotic species) and a variety of reptiles, amphibians, and rodents may be found throughout the WSA. Several species of raptors and song birds also inhabit the area. Cougar and desert bighorn sheep may occasionally visit the area.

Due to the lack of precip tion, the nature of the soils, redrock cliffs, and extremely hot summer temperatures, this area is not capable of supporting a diversity of vegetation sufficient to produce large populations of big game animals. The most common big game present is mule deer, which are found in relatively small numbers. The Utah Division of Wildlife Resources (UDWR) estimates the resident mule deer population to be about 39 animals (consuming 81 AUMs). Deer migrate from the WSA in summer due to lack of water. Cougar may visit the WSA occasionally in winter to hunt deer. Desert bighorn sheep are found in canyons along the Colorado River and may sometimes visit the WSA. No population estimates for

bighorn sheep are available from the UDWR for this WSA.

Upland game includes mourning dove and cottontail rabbit. Chukar partridge can be found along the talus slope northeast of the WSA, on the flats to the south of the WSA, and probably within the WSA as well.

Several species of snakes and lizards are present. The most common are horned lizard, Great Basin sagebrush lizard, northern plateau lizard, northern tree lizard, sideblotched lizard, whiptail lizard, collared lizard, gopher snake, striped whipsnake, and the midget faded rattlesnake. Most of these species could be found throughout the WSA. Amphibians would not be common in this WSA. The tadpole shrimp, a crustacean, may be present in potholes.

The most common birds in the WSA are canyon wren, rock wren, red-tailed hawk, golden eagle, great horned owl, kestrel, prairie falcon, and raven. Juncos are a winter visitor to this WSA. Habitat for most of these species is unitwide. There have not been any raptor nests located within the WSA.

The cliffs, fins, ledges, crevices, and holes in the cliff face also provide perches and nesting habitat for red-tailed hawk, great horned owl, prairie falcon, kestrel, and raven. Small mammals, bats, and songbirds also depend on these cliffs, ledges, and crevices for cover and nest sites.

The black-footed ferret and the American peregrine falcon are endangered species that may be found in the area. There are no known eyries within this WSA. Desert bighorn sheep and golden eagles (a BLM sensitive species) may possibly be found in the WSA. Both species are also sensitive to human intrusion. Potential habitat would extend over the entire WSA acreage.

The WSA is entirely within UDWR Deer Herd Management Unit 30A. There is no crucial wildlife habitat. No wildlife habitat improvements or vegetation manipulation areas, existing or proposed, are within the WSA.

Forest Resources

Species in the WSA associated with forest resources include pinyon and Utah juniper. These are not found in significant stands, with an estimation of 221 cords of firewood available. There has been no significant harvest of woodland products from the WSA. Occasional use by campers may occur.

Livestock and Wild Horses/Burros

Grazing is an historical use in this WSA. The entire WSA lies within the Blue Hills Grazing Allotment (61,789 acres, 2,700 AUMs). The WSA comprises 20 percent of the total allotment area. One operator is licensed to graze cattle on this part of the allotment from November 1 to February 28. Use of the WSA is minimal because of inaccessibility, lack of water, and poor quality forage. Grazing capacity within the WSA is quite low (greater than 40 acres per AUM) because of extensive rock outcrop and poor soils. The WSA accounts for 160 AUMs.

No range improvements are within the WSA, and no opportunities have been identified for possible improvements.

Wild horses or burros are not known to frequent the WSA.

Visual Resources

The Behind the Rocks WSA contains striking scenery unique to the area. Its rugged terrain is an intricate maze of sandstone fins, deep crevices, spires, arches, alcoves, and potholes. The rounded organic shapes have eroded from the Navajo petrified sand dunes. The rock landscape is rich in form, line, and texture. Unusual color contrasts occur as the pink and buff rocks change to orange, red, and purple as the sun angle changes. The fins create a play of shadows visibly moving across rock faces. Desert varnish has streaked the fins with ribbons of black, brown, and purple. Clearly shown are the striated beds of layers of sand, cemented into solid rock. Isolated potholes filled with water serve as small mirrors that reflect the sunlight.

In a visual study (Ray Mann Associates, Inc., 1977) the entire WSA (12,635 acres) was rated as having Class A scenery and high visual sensitivity. It is also in a foreground/middleground zone. The entire 12,635 acres are under VRM Class II management objectives. Refer to Appendix 7 for an explanation of BLM's VRM rating system.

Cultural Resources

The WSA is in an area known for visible signs of past Indian inhabitants. No cultural inventory has been made of the WSA, but five sites have been reported. Of these sites, three are prehistoric, one has both prehistoric and historic aspects, and the fifth is historic. The three prehistoric sites are petroglyph panels. The combination site has

three structures and rock art. The structures are locally called the Indian Fortress. Nearby are a set of historic inscriptions and a panel of petroglyphs and pictographs. Another set of historic inscriptions is found near a natural arch (Otho Arch) on the west side of the WSA.

The presence of a prehistoric granary just outside the WSA along the Colorado River and of many petroglyph panels just outside the WSA along each side of the Colorado River, the Moab Rim, and Hunters Canyon indicates that additional sites probably exist within the WSA.

The Old Spanish Trail, dating to the 1830s and followed by Mexican traders and early explorers, went through Spanish Valley just east of the WSA. European use of the WSA probably dates from the 1870s when permanent settlement of Moab occurred. The WSA has been used for livestock grazing since before the turn of the century; a cattle trail runs up the cliff into the WSA along the hidden valley above Moab, ending near the Indian Fortress.

No National Register sites occur within the WSA, although the Indian Fortress (about 5 acres) could qualify. It is estimated that the WSA may contain as many as 30 cultural sites, 13 of which would have National Register potential. Table 8 summarizes known cultural resource sites.

TABLE 8
Known Cultural Resource Sites

Name	Description of Site
The Fortress	Two 15- to 20-foot diameter dry wall stone rings, 2 to 3 feet high, and a small two-room granary, with scattered lithics and potsherds (reportedly Pueblo II). Also Archaic, Pueblo, and Ute petroglyphs and pictographs; historic instructions dated to 1892.
Mastodon Petroglyph	Petroglyph of a mastodon-like animal, just on the north WSA boundary. Possibly Paleo-Indian.
Petroglyphs	Two sites near Pritchett Canyon.
Otho Arch	Natural arch with historic inscriptions.

Source: USDI, BLM, 1983.

Recreation

Behind the Rocks WSA offers recreational opportunities in the form of hiking, camping, backpacking, photography, sightseeing, and other similar uses. There are fins suited for technical climbing, rappelling, or scrambling, and some horse packing takes place. The WSA is not known as a hunting area due to lack of big game. Perimeter roads are popular four-wheel drive trails, and the northern end of the WSA (about 300 acres) receives some ORV use.

Although it lies only 1 mile from Moab and within a few hundred yards of settled areas in Spanish Valley (south of Moab), the WSA is isolated by virtue of the 1,000- to 1,800-foot cliffline west of Moab and the extremely rugged topography. Access is via the Moab Rim jeep trail in the northern end, the Pritchett Canyon road (passable only to four-wheel drive vehicles), the trail up Hunters Canyon on the west side, or from the Behind the Rocks road south of the WSA. There are numerous places where a wilderness user could hike into the WSA from along these roads and trails. Access up the cliff face is generally along the foot trails through Hidden Valley or past Jackson Reservoir, although other hiking routes are possible. Access routes up the cliff face and up Pritchett Canyon involve crossing State or private lands.

Although use statistics for the area are not known, current use is probably less than 100 visitor days per year. Approximately 50 percent of the use is for primitive recreation and 50 percent for ORV-related recreation activity. The WSA probably attracts one or two parties of hikers/backpackers per week in the summer season. Local Scout groups have made periodic horseback and hiking trips from Moab to the Indian Fortress. Perimeter jeep roads are heavily used during Easter and Labor Day weekends during the annual Moab jeep safari, increasing related ORV use, hiking, and sightseeing in the WSA. On Easter weekend, 1983, the jeep safari had approximately 65 vehicles attempt the Pritchett Canyon road, and about 35 vehicles tried the Moab Rim Trail to the Indian Fortress.

Under the Grand RMP, the entire 12,635-acre WSA would be closed to ORV use under 43 CFR 8340. This designation would not apply to the road up Pritchett Canyon nor to the main Moab Rim jeep trail, but would apply to short spur routes branching from them, as well as to the 300 acres in the northern end of the WSA that currently receive some ORV use.

Access to the WSA is generally via perimeter jeep trails (also used as hiking trails); from the old cattle trail proceeding just south of Moab up the cliff, through the hidden valley to the Indian Fortress; or from a second foot trail leading from Moab past Jackson Reservoir and joining the Hidden Valley trail. There are no designated or maintained trails, campsites, or facilities within the WSA. The boundary roads and one short trail

within the WSA are described in a jeep tour and a hiking book (Barnes, 1981 and 1978), and the Moab Rim trail is described as a hiking route in a Utah hiking guidebook (Hall, 1982).

Wilderness Values

SIZE

The WSA contains 12,635 acres. It is about 11 miles long, northwest to southeast, and from 0.5 to 3 miles wide.

NATURALNESS

The WSA remains generally natural. Most imprints are associated with vehicle use, but none is considered substantially noticeable within the unit as a whole. About 40 percent or 5,050 acres within an area of mostly slickrock fins are untouched.

Two short roads were constructed off the Pritchett Canyon boundary road for mineral exploration in the mid-1970s. The first runs east for about 0.5 mile in Sections 23-24, Township 26 South, Range 21 East, ending at a small drill pad. The second runs along the north side of a butte paralleling the boundary road for about 0.75 mile in Section 25, Township 26 South, Range 21 East, then rejoins the boundary road. It then runs about 1 mile east into the WSA in Section 30, Township 26 South, Range 22 East. A row of drill holes runs along this road. Although constructed, the roads have not been maintained and so are considered as ways and were not used as boundaries for the WSA. They may have been constructed after FLPMA. In addition, a vehicular way extends about 0.75 mile up a side drainage of Hunters Canyon. The route is not heavily used, and tracks are limited to the wash bottom and disappear after each major rain.

A way extends about 1 mile into the WSA along the Moab Rim cliff on the southern tip of the WSA, leading to a natural arch. This drive is described in a local jeep tour guide book (Barnes, 1977). Because of the fin topography and slickrock, the way is not noticeable from a distance. A .3-mile-long way extends up Moonflower Canyon. The way was used as a route for a water pipeline constructed in 1984. The pipeline carries water from a spring development in the canyon to private land outside the WSA. Construction of the spring development and pipeline was authorized in 1976 (pre-FLMPA) and the right to develop was affirmed by IBLA. The pipeline route has been recontoured and rehabilitated. In all, there are approximately 3.55 miles of way within the WSA. Although these are the most substantial imprints in the WSA, they are felt to be substantially unnoticeable within the unit as a whole because of the topographic screening, minimal grading, and lack of vegetation on the surrounding bare rock.

In addition to vehicular ways, vehicle tracks can be found in the northern end of the WSA near the Moab Rim jeep trail (boundary road). These are from four-wheel, three-wheel, and two-wheel vehicles. Because of the sandy soils, the tracks would revegetate quickly if use were discontinued. Tire tracks across slickrock are generally not noticeable, except from the immediate vicinity. In total, the area disturbed comprises about 300 acres.

Seismic lines were run by helicopter across the WSA in 1981-82. Both lines generally paralleled the Moab Rim cliff. The first involved about 2.6 miles of the WSA (about 60 shot holes). The second involved two sections of the WSA, each about 1.5 miles long (about 15 shot holes each). All access was by helicopter. In some sections of the north end of the WSA, for about 1.5 miles, burn marks remain on the slickrock.

These imprints combined cover about 300 acres (less than 2 percent) of the WSA. None are felt to impair the naturalness of the WSA as a whole and will become less noticeable with the passage of time due to natural weathering processes.

The entire WSA is considered as meeting the wilderness standard for naturalness.

SOLITUDE

The WSA affords outstanding opportunities for solitude. Unusual topographic screening is created by the sandstone fins, and vertical isolation is created by the Moab Rim.

The size of the WSA neither enhances nor detracts from opportunities present. The long, narrow configuration might detract from opportunities, were it not for the extreme vertical relief within and along the perimeter of the WSA.

Topographic screening contributes most toward outstanding opportunities for solitude. The tall, narrow fins form interconnecting passageways, providing a myriad of potential travel routes, and both sights and sounds of nearby parties are blocked. The vertical separation afforded by the Moab Rim, the cliff above the Colorado River, and to a lesser extent by Pritchett Canyon, enhance the remoteness of the WSA and the feeling of isolation. Vegetation within the WSA is minimal; therefore, vegetation screening is not significant.

Sights and sounds of human activities are present from many places within the WSA. Most notably,

the Town of Moab and settlement in Spanish Valley are both visible and audible all along the Moab Rim, as is traffic along U.S. Highway 191. From the northern edge of the WSA, State Highway 279 (the Potash Road) on the north side of the river, the paved Kane Springs Canyon Road (known locally as the Egg Ranch Road) on the south side of the river, private homes and farmland along the Kane Springs Canyon Road, and two large powerlines are all visible. A major utility corridor runs just outside the WSA at the base of the Moab Rim cliffline. It contains three transmission lines and two buried natural gas pipelines. The pipelines cut over the cliffline just south of the WSA. A maze of oil exploration seismograph lines, roads, and drill locations lie south of the WSA on the sand flats properly named Behind the Rocks; these are visible from the south edge of the WSA and from other vantage points. Occasionally heavy ORV use of boundary roads could cause an influence within the WSA. More distant activities may be visible from portions of the WSA, particularly the Potash plant to the west and drilling activities to the north.

It would be easy for a visitor to find seclusion within the WSA due to the screening and alternate travel paths afforded by the sandstone fins. In these areas, sights and sounds of others within the unit could easily be avoided. In the open drainages in the central portions of the WSA it would be more difficult to find a secluded spot, but the sandstone ledges would offer some opportunities.

In spite of outside influences, the entire WSA (12,635 acres) presents opportunities that, overall, meet the outstanding criterion for lands under wilderness review. The massive sandstone fins provide exceptional screening potential. Where sights and sounds of outside activities do occur, the magnificent vistas afforded dwarf their impact. The WSA provides for a dispersion of visitors throughout.

PRIMITIVE AND UNCONFINED RECREATION

The WSA offers outstanding opportunities for hiking, backpacking, and related activities. Rock scrambling and climbing are also possible. With its beautiful red sandstone fins, geologic and archaeologic features, and scenic vistas, the WSA is well suited for sightseeing and photography. The fins provide a myriad of potential hiking routes; the alcoves provide camping spots. Both the Indian Fortress and Otho Arch serve as destination points, adding to the interest of the area. Opportunities for hunting are not good because of the scarcity of big game. Although some horsepacking takes place along the eastern side, the interior of the WSA is too rugged for prime opportunities and, in places, impassable for horses.

The primitive recreation opportunities on all 12,635 acres within the WSA meet the outstanding criterion for lands under wilderness review. The extremely unusual fin topography enhances hiking and sightseeing opportunities to a degree not often equaled in the region.

SPECIAL FEATURES

The geologic features and resulting landscape of the WSA are unique. Although four arches are known, the WSA has potential for other arches or geologic features not yet discovered. Scenery within the WSA is spectacular; panoramic views of southeastern Utah from vantage points in the WSA are also notable. The Indian Fortress is unlike other Indian ruins in the vicinity; its purpose is still unknown. The mastodon petroglyph may be significant in dating its parent culture. The WSA holds promise for other cultural sites yet undiscovered. The geologic structures and Indian sites provide educational values. The possibility for paleontologic resources is present within the WSA.

Land Use Plans and Controls

Land use is relatively intense north and northeast of the WSA. Moab and the settlement in Spanish Valley back up to the base of the cliff. Major highways (U-279 and U.S. 191) run along the Colorado River and along the foot of the Moab Rim. Three major powerlines (69-, 138-, and 345-kilovolt [KV]) and two major cross-country natural gas pipelines (MAPCO and Northwest Pipeline) run along a utility corridor near the bottom of the cliff just outside the WSA. The land along the Colorado River is used for farming and some residences along the paved Kane Springs Canyon road just north of the WSA. A powerline (69-kV) right-of-way running to the potash plant forms the northwestern WSA boundary. The area immediately south of the WSA has been intensively used for mineral exploration (seismic surveys and drilling). There are no private lands or existing rights-of-way or pending applications within the WSA. There are no facilities within the WSA.

The State has one section in-held (refer to Map 1). It remains undeveloped but is under mineral and grazing lease. A second State section, which is also under mineral and grazing lease, juts into the WSA along the western border. Tracts of State and private lands zigzag along the north and northeastern borders. The State has retained mineral rights to one tract with BLM surface, which is adjacent to the WSA on the east. This was

originally a State grant, but portions were reconveyed to the Federal Government by warranty deed with the State retaining rights to all minerals. Part of this tract (135 acres) was originally included in the WSA boundary but was deleted by a notice in the *Federal Register* on May 11, 1983. A recent United States District Court decision (Sierra Club et al. vs. Watt, 4-19-85) resulted in these split estate lands being included again within the WSA boundary. The policy of the State of Utah is to maximize economic return from its lands.

The WSA is managed by BLM's Grand Resource Area under the Grand RMP. It is managed under multiple use with some restrictions on ORV use and oil and gas activity, as noted in the description of the No Action Alternative. The RMP does not address potential wilderness designation for the WSA. Uses permitted in the RMP are identified under the No Action Alternative. The RMP has been reviewed by the Governor of the State of Utah and is consistent with State plans and policies.

A powersite withdrawal along the Colorado River includes 340 acres of the WSA. This withdrawal dates to 1909 and was initiated to reserve potential areas for hydroelectric powersites. The portion of the withdrawal within the WSA is on top of the cliff, well above any potential reservoir level. Development of the potash mine to the west, Atlas Minerals uranium mill near Moab, and private residences along this part of the Colorado indicate that development of a hydroelectric dam and reservoir would be highly unlikely.

The WSA lies in both Grand and San Juan Counties. Both counties have a county master plan; neither favors wilderness designation within the county. Both plans generally emphasize continuation of present use and maximum, mineral development. The *Grand County Master Plan* (University of Utah, Bureau of Community Development, 1979) recognizes the WSA as an area "... of critical environmental concern which we want preserved. Not enough is known regarding subsurface minerals and resources . . . .[This area] must be studied intensively, including drillings and other appropriate samplings." The *San Juan County Master Plan* (Planning and Research Associates, 1967) predates wilderness considerations. It includes goals of making the natural and scenic resources of the county available to tourists and encouraging the development of mineral resources to support the county economy; the plan noted that livestock and agricultural operations were an important but minor part of the economy. The plan zones the area of the WSA as being open range with the potential for agricultural development in the Moab Valley. The San Juan County Commission (1980) opposes any administrative or legislative designation of wilderness in the County.

Socioeconomics

DEMOGRAPHICS

Although the WSA straddles southern Grand County and northern San Juan County, the socioeconomic area of influence for the WSA is confined to Grand County and the Moab area because of the WSA's proximity to this town. Grand and San Juan Counties can be summarized as rural and sparsely populated. Mining accounts for the majority of jobs in each county and, since 1980, both have suffered from significant unemployment as a part of a nationwide recession and a downturn in mining and milling.

The 1981 Grand County population was 8,400. The majority of the county is unpopulated, with 97 percent of the settlement concentrated in the Moab area. About 65 percent of the county's population lives in Moab, and 32 percent lives in Spanish Valley, which is adjacent to and southeast of Moab (U.S. Department of Commerce [USDC], Bureau of the Census, 1981). Grand County comprises 3,615 square miles (about three times the size of Rhode Island). About 80 percent of the County is owned by the Federal Government, 15.5 percent by the State and 4.5 percent by private landowners (USDC, Bureau of the Census, 1981).

San Juan County had a 1981 population of 12,700, not quite 1 percent of the State population. The majority of the county is unpopulated. The county has two service centers. Monticello, the county seat, had a 1980 population of 1,930, and Blanding, about 20 miles south, had a 1980 population of 3,120. San Juan County is one of the largest in Utah, comprising 7,885 square miles (about the size of New Jersey). About 85 percent of the county is owned by the Federal Government, 6 percent by the State, and 8 percent by private landowners (University of Utah, Bureau of Economic and Business Research, 1982).

EMPLOYMENT

As shown in Table 9, 99 percent of Grand County's wage and salary employment is nonagricultural, with about 82 percent employed in private industry and 17 percent employed in Federal, State, and local governments. Mining and tourism are the most important private industries in Grand County. Mining directly accounts for 25 percent of local employment; however, recent uranium

TABLE 9
1981 Personal Income and Employment
Grand and San Juan Counties, Utah

Industrial Sector	Grand County		San Juan County	
	Income Percent	Employment Percent	Income Percent	Employment Percent
Agriculture	1	Less than 1	2	4
Total Agricultural	1	Less than 1	2	4
Mining	34	25	50	32
Construction	7	5	6	3
Manufacturing	1	Less than 1	4	5
Transportation and Public Utilities	10	8	5	5
Wholesale Trade	10	8	2	3
Retail Trade	10	18	5	9
Finance, Insurance and Real Estate	3	2	1	1
Services	11	16	8	11
Other	--	--	--	--
Total Private Industry	85	82	80	70
Federal Government	5	6	2	4
State and Local Government	9	11	16	22
Total Government	13	17	18	26
Total Nongovernment	99	99	98	96
Unemployment (1st Quarter, 83)		18		10.4
	(Dollars)	(Jobs)	(Dollars)	(Jobs)
Total Employment and Earnings	$52,753,000	3,617	$59,743,000	3,943
Total Personal Income	$75,404,000		$66,869,000	

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1983.

Note: Because of rounding, numbers are not additive. Total and percentage income figures include wage, salary, and proprietors' income. Employment percentage figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other.

mining and milling layoffs may reduce mining's local importance. The service sector, which includes tourism, accounts for approximately 16 percent of Grand County's employment.

The mining and tourist industries purchase some of their supplies locally, and those who work in these industries spend part of their income locally. This circulation of money from export industries contributes to local income and employment. Unemployment in the county is among the highest rates in the State, approaching 12 percent in 1982. This is due primarily to large mine layoffs and the resulting downturn of the local economy.

As shown in Table 9 almost half of San Juan County income and over 30 percent of employment is from mining. Government and tourism are San Juan County's next most important sources of employment and income. Unemployment in the county is high. The unemployment rate in the third quarter of 1982 was around 10 percent. In addition, about 20 percent of county residents are on welfare and do not show up on unemployment statistics. The percentage of unemployed people is greater on the Indian Reservation.

TABLE 10
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	$21,420
Mining Claim Assessment	$15,400	None
Livestock Grazing	$3,200	$224
Recreational Use	$410	None
Total	$19,010	$21,644

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total income that would be generated by these expenditures.

INCOME AND REVENUES

Income in both Grand and San Juan Counties is most dependent upon the mining sector (34 percent in Grand County and 50 percent in San Juan County). The government sector is the second largest contributor.

Economic-related activities in the WSA include mineral exploration, mineral leasing, livestock production, and recreation. Table 10 summarizes local sales and Federal revenues from the WSA. Appendix 9 identifies the multipliers used to estimate sales and revenues.

The WSA has 154 mining claims. Regulations require a $100 annual expenditure per claim for labor and improvements, an undetermined part of which is spent in the local economy. The geophysical exploration that has been conducted in the WSA has generated some temporary local employment and income.

One livestock operator has a total grazing privilege of 160 AUMs within the WSA. If all this forage

were utilized, it would account for $3,200 of livestock sales and $800 of ranchers' returns to labor and investment.

The WSA's nonmotorized recreational use is low and related local expenditures are low and insignificant to the local economy. The WSA's motorized recreational use is also low and related local expenditures are low and insignificant. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for Behind the Rocks WSA is estimated as about 100 visitor days per year. Only a portion of the expenditures for recreational use of the WSA contribute to the local economy of Grand County.

The WSA generates Federal revenues from mineral leases and livestock grazing fees (refer to Table 10).

Oil and gas leases in the WSA cover approximately 7,140 acres. At $3 per acre, lease rental fees generate up to $21,420 of Federal revenues annually. Half of these monies are allocated to the State, which then reallocates these revenues to various funds, the majority of which are related to energy development and mitigation of local impacts of energy and mineral development.

Average actual livestock use and, therefore, revenues generated from grazing in the WSA are unknown; however, the permittees in the WSA can use up to 160 AUMs per year. Based on a $1.40 per AUM grazing fee, the WSA can potentially generate $224 of grazing fee revenues annually, 50 percent of which would be allocated back to the local BLM district for the construction of rangeland improvements.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines For All Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without control for wilderness protection. The degree of future development is unknown but would probably be low due to the area's rough and restrictive terrain. The following is a worst-case analysis, based on the assumption that minerals would be developed sometime in the future and would result in the following disturbance: oil and gas, 310 acres; uranium and copper, 40 acres; and potash, 420 acres. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed by the State of Utah as a PSD Class II area. Disturbance of 770 acres would result in minor, temporary increases in fugitive dust emissions. These emissions would be limited by Class I areas near the WSA. Arches National Park is only 3 miles north of the WSA.

GEOLOGY

No impacts to geology are expected because surface disturbances associated with uranium, potash, and oil and gas exploration and development activities would probably not exceed 770 acres. This would not affect the geologic structure of the WSA. Subsidence is generally not associated with potash mining in the area.

SOILS

It is estimated that up to 770 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.5 cubic yard/acre/year but would increase to 2.5 cubic yards/acre/year if disturbed. Soil loss on the 770 acres would increase from 385 cubic yards/year to 1,925 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined. Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 1,540 cubic yards (5 percent) over current annual soil loss.

VEGETATION

The potential maximum disturbance of 770 acres is only 6 percent of the WSA and would not significantly alter the WSA's sparse vegetation.

Three sensitive species (*Astragalus isleyi*, *Zigadenus vaginatus*, and *Asclepias cutleri*) may occur within or near the WSA. Before authorizing surface-disturbing activities (770 acres potential) the BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If threatened or endangered species could be affected, the BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken to protect these plants, it can be reasonably concluded that the viability of populations of sensitive plant species would be preserved under the No Action Alternative.

WATER RESOURCES

Impacts to water interrelate closely to soils. Where surface disturbance occurs, increased sediment yield can affect water quality. Surface disturbance from mineral exploration and development could impact 770 acres under this alternative, with a soil loss increase of approximately 1,540 cubic yards/year. Rough terrain and management restrictions, however, make the possibility of development questionable. Since precipitation is low and all streams are ephemeral within the WSA, no significant sedimentation or change in TDS is expected to occur from the 1,540 cubic yards of annual soil loss from surface disturbance. Opportunities for water improvements could occur as allowed in the Grand Resource Area RMP. No developments are currently planned.

Mineral exploration and development in the area is generally confined at or near the surface or with widely spaced wells; therefore, in most cases, these activities would not significantly impact ground water. However, development of potash, depending on methods used, could result in a reduction of ground water quality.

Some of the increased sediment could reach the Colorado River but because the sediment load of the river is so large, there would be no appreciable change in the quality of the river's water.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Oil and gas categories in the WSA would remain the same (3,325 in Category 1; 260 acres in Category 2; 4,770 acres in Category 3; and 4,280 acres in Category 4). The wilderness stipulations on existing post-FLPMA leases would be lifted, and there would be an additional 1,215 acres available for lease.

The WSA is considered moderate in potential for oil and gas occurrences with 10 to 50 million barrels of oil (3 to 15 million estimated recoverable) or 60 to 300 billion cubic feet of natural gas existing (18 to 90 billion estimated recoverable). These oil and gas resources could be explored and developed without concern for wilderness values. However, due to the rugged terrain and lack of production from nearby holes, indications are that development would be unlikely.

Potash

The entire WSA would be open to potash leasing. The potential indicates that 1 to 10 million tons of potash may be present under the WSA. Of that, approximately 75,000 to 7.5 million tons are considered recoverable. The rugged surface of the WSA compared to producing areas nearby, the low prices, and more feasible areas in the vicinity indicate that interest in exploration, leasing, or development of the potash resource would be unlikely.

Locatable Minerals

Uranium and Associated Minerals

Locatable mineral development could occur within the WSA. The entire area would remain open to mining claim location. The potential deposit containing 500 to 1,000 tons of uranium oxide could be developed. Vanadium and copper (less than 50,000 tons), which are considered strategic and critical materials, could also be recovered. However, the WSA's rugged terrain, geologic dip, and the location of more feasible areas nearby indicate that claim development within the WSA would be unlikely.

WILDLIFE

Wildlife could be adversely affected by possible surface disturbance associated with mineral exploration and development (770 acres), especially if it were to occur in the form of roads and drill pads throughout the WSA. About 70 percent of the WSA, however, is restricted in terms of energy leasing. These restrictions benefit wildlife in the WSA by restricting areas where disturbance would be allowed. The remaining acreage (3,785 acres) could be disturbed by exploration and development of mineral leases. Adverse impacts to wildlife would be short term while work was ongoing, and habitat could be enhanced over the long term by reclamation and revegetation.

The increased availability of water through the construction of water catchments and reservoirs that could be developed without concern for wilderness values would be beneficial for wildlife. No such improvements have been proposed within the WSA.

Two species of endangered animals (black-footed ferret and peregrine falcon) and BLM sensitive species (golden eagle) may be found within or near the WSA. Before authorizing surface-disturbing activities (770 acres potential) the BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If threatened or endangered species could be affected, the BLM would initiate formal Section 7 consultation with the FWS as required by the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken to protect these animals, it can be reasonably concluded that the viability of populations of threatened, endangered, or sensitive animal species would be preserved under the No Action Alternative.

FOREST RESOURCES

Since there is a limited source of trees within the WSA and only occasional use (campers) of wood occurs in the area, changes in the harvest or use of forest resources are likely in the future. Surface-disturbing activities could reduce the number of trees present.

LIVESTOCK

Domestic livestock grazing would continue as authorized in the Grand Resource Area RMP. The 160 AUMs currently allocated in the WSA are controlled by one livestock permittee. Facilities for livestock handling could be proposed and developed in the future without regard for wilderness values. None are currently planned. Motorized vehicles are currently used very little to manage livestock in the WSA and this is unlikely to change. Overall, few, if any, changes in livestock management techniques are expected. The WSA accounts for less than 6 percent of the AUMs in the Blue Hills Grazing Allotment and receives little use due to restrictive topography and poor forage; therefore, any loss of forage due to mineral development would probably have little effect on grazing use.

VISUAL RESOURCES

Under this alternative, visual quality in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., about 12,635 acres would be closed to ORV use; oil and gas categories would include Category 3 [no surface occupancy] on 4,770 acres and Category 4 [closed to leasing] on 4,280 acres; and the entire 12,635 acres would be managed under VRM Class II objectives requiring that activities not be apparent).

However, under this alternative 770 acres of mineral-related exploration and development are possible. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. VRM objectives would probably not be met in VRM Class II areas during the short term. Even after rehabilitation, some permanent localized degradation would be expected. If roads, vehicular ways, and drill pads are located throughout the area (worst-case analysis), visual quality could be significantly reduced in the WSA as a whole.

CULTURAL RESOURCES

Protection of cultural values would continue as currently provided. There is a potential for 770

acres of surface disturbance by mineral exploration and development under this alternative; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance. Still, inadvertent loss or damage could occur in the disturbed area. Increased access due to mineral development would lead to increased vandalism of sites. There are no existing sites within the WSA on the National Register of Historic Places; however, some of the sites do have National Register potential.

RECREATION

The entire 12,635 acres would be closed to ORV use per decisions documented in the Grand RMP. This designation would not apply to the road in Pritchett Canyon to the main Moab jeep trail. Approximately 300 acres in the northern end of the WSA would continue to receive ORV use.

Primitive recreation values would be foregone within the 770 acres where potential mineral and energy surface-disturbing activities could take place. The future trends in recreational use of the WSA are unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use is expected to increase from 100 current visitor days per year to 150 visitor days at the end of 20 years.

WILDERNESS VALUES

None of the area would be designated wilderness, and management would be under the Grand RMP. Under this alternative, wilderness characteristics in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., about 12,635 acres would be closed to ORV use; oil and gas categories would include Category 3 [no surface occupancy] on 4,770 acres and Category 4 [closed to leasing] on 4,280 acres; and the entire 12,635 acres would be managed under VRM Class II objectives requiring that activities not be apparent).

However, under this alternative, 770 acres of mineral exploration and development are possible. The related surface disturbance would result in a significant loss of naturalness, solitude, and outstanding opportunities for primitive and unconfined recreation in the area as a whole if roads, vehicular ways, drill pads, etc. are located throughout the WSA. The probability for this type of disturbance, however, is questionable due to the rugged terrain constraints, etc.

Opportunities for hiking, backpacking, climbing, rock scrambling, sightseeing, and photography are outstanding and would only be protected in areas where management restrictions occur or are developed.

LAND USE PLANS AND CONTROLS

This alternative would generally be consistent with *Grand and San Juan County Master Plans* although the ORV closure and continuation of the 4,280-acre mineral leasing closure might conflict with the counties' policies of mineral and tourism development. The Bureau of Reclamation powersite withdrawals could continue. This alternative would be consistent with plans and policies of the State of Utah and in conformance with BLM's Grand RMP. State in-holdings would remain under State ownership.

SOCIOECONOMICS

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the oil and gas, uranium, and potash in the WSA were developed it would lead to an increase in employment and income for Grand County. The potential for the occurrence of minerals within the WSA is moderate, although the likelihood of development is low due to rough terrain, etc. (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the existing grazing use (100 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase to only 150 visitor days/year in 20 years and overall recreation-related expenditures average only $4.10 per visitor day (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA would likely not be significant to the local economy.

Federal and State revenues would not be reduced by this alternative. There are 1,215 unleased acres in the WSA which are open to oil and gas leases. If leased, they would bring up to $3,645 additional

Federal lease fee revenues per year. Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees ($224 per year) would continue. About 50 percent of the increased revenues would continue to be returned to the local BLM office for use in range improvement projects.

All Wilderness Alternative (12,635 Acres) (Proposed Action)

As identified in the Description of the Alternatives section, the major changes that could occur in the 12,635-acre area would be related to its withdrawal from mineral location and closure to new mineral leasing and sale. The entire area would be placed in leasing Category 4 (closed to leasing). The WSA would be closed to vehicular use except for approvals by BLM as discussed in the Description of the Alternatives section. The WSA would be managed under VRM Class I.

For the following analysis it is assumed that the existing mining claims would eventually be explored and developed, causing an estimated 40 acres of disturbance within the WSA. It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing of oil and gas or potash would not be allowed. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates for the WSA.)

Because potentially disturbed areas for this alternative would be only 40 acres, compared to 770 under the No Action Alternative, the impacts from development and surface disturbance on air quality, geology, vegetation, water, wildlife, livestock, forest, and cultural resources under the All Wilderness Alternative would be insignificant. Wilderness designation would provide additional protection to these resources as compared to the No Action Alternative because it would reduce the potential for disturbance. Other effects on these resources due to changes in management are discussed below.

SOILS

The soil resource could benefit from the All Wilderness Alternative because of the reduced likelihood of surface-disturbing activities.

It is estimated that up to 40 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.5 cubic yard/acre/year but would increase to approximately 2.5 cubic yards/acre/year if disturbed. Soil loss on the 40 acres would increase from 20 cubic yards/year to 100 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined. Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 80 cubic yards which is 1,460 cubic yards less than under the No Action Alternative.

WATER RESOURCES

Opportunities for watershed improvements could be limited because wilderness protection criteria must be met. No improvements are currently planned.

Wilderness designation would protect the water quality of ground water in the WSA because potash development with the potential for degrading ground water quality would not occur.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Designation of the WSA would have an impact on exploration for oil and gas. Post-FLPMA leases (currently covering 2,500 acres of the WSA) and pre-FLPMA leases (4,640 acres) could be developed if valid discoveries are made. However, it is believed that existing leases will expire before discoveries are made. Undiscovered oil and gas resources would not be explored or produced. The potential of the area is moderate, with 10 to 50 million barrels of oil or 60 to 300 billion cubic feet of natural gas. Of these amounts, 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas are estimated to be recoverable. These resources would be foregone under this alternative. However, due to the rugged terrain, lack of production from nearby holes, and management constraints, indications are that development would be unlikely even without wilderness designation.

Potash

Under this alternative, the area could not be leased for potash development. The WSA is underlain by potash deposits; however, structural deformation occurring during and after deposition have made some areas, including the WSA, only moderately favorable for potash occurrence. It is estimated that there are 75,000 to 7.5 million tons of potash recoverable under the WSA that could be foregone under this alternative. The area could not be leased; however, due to the rugged terrain, compared with producing areas nearby, development is unlikely even without wilderness designation.

Locatable Minerals

Uranium and Associated Minerals

There are 154 mining claims covering 2,680 acres (21 percent) of the WSA. Claims located prior to wilderness designation could continue to be worked in accordance with valid rights existing at the time of wilderness designation, but operations could not cause unnecessary or undue degradation of wilderness values. Claims would be subject to a validity exam and those not current in assessment or not showing a valid discovery would be declared null and void. Approximately 147 of the 154 claims in the WSA appear to have current assessment. If minerals are located prior to wilderness designation, it is estimated that up to 40 acres could be disturbed due to exploration and development of the uranium and copper resources.

The uranium/vanadium-bearing strata are known to occur in the WSA; however, due to the depth of overburden, the favorable host rocks are well below the surface and economic costs of extraction would be high. The worst-case impact to uranium production would occur if reserves are not within claims filed before wilderness designation. In that case, the potential for recovery of 500 to 1,000 tons of uranium oxide would be foregone. Vanadium and copper (less than 50,000 tons), which are strategic and critical minerals, would also be foregone. The entire wilderness would be closed to future claim location.

WILDLIFE

Wildlife would benefit from the protection of solitude and reduction of direct surface disturbance from 770 acres under the No Action Alternative to only 40 acres under wilderness designation. There is no critical wildlife habitat within the WSA. Possible endangered species in the WSA include the peregrine falcon and black-footed ferret, which would benefit from reduced disturbance. Any impacts from surface disturbance would be short term and measures would be taken to protect these species as described for the No Action Alternative. Reclamation following surface disturbance could result in increased forage production. The opportunity to increase forage production would be limited to 40 acres under wilderness designation as compared to 770 acres under the No Action Alternative. Wilderness designation could restrict development of facilities or vegetation treatments for wildlife in the WSA; however, none have been proposed.

LIVESTOCK

Present domestic livestock grazing would continue as authorized in the Grand RMP. The 160 AUMs currently allocated in the WSA are controlled by one livestock permittee but are not utilized. There are no existing developments for range management in the WSA. New rangeland developments would be allowed on a case-by-case basis if necessary for resource protection (rangeland and/or wilderness) and the effective management of these resources, provided that wilderness protection standards are met. Future roads or other livestock management facilities could be restricted to protect wilderness values but none have been proposed. Overall, there would be no changes in livestock management in the WSA.

VISUAL RESOURCES

Wilderness designation would contribute to the preservation of the area's visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I, which generally allows for only natural ecological change and from closure of the entire area to mineral leasing and location.

Under this alternative, 40 acres could be disturbed by development of valid mining claims. Although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation, some permanent localized degradation could be expected. If roads for development of valid mining claims could not be denied (worst-case analysis), VRM Class I objectives may not be met throughout large portions of the WSA. Because the potential for development of mining claims is low, visual quality would probably not be reduced in the WSA as a whole.

CULTURAL RESOURCES

As much as 40 acres could be disturbed by mineral exploration and development; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any and all proposed surface disturbance and would mitigate any adverse impacts. Inadvertent loss or damage to cultural resources could occur, although these impacts are expected to be minimal.

There is potential for increased vandalism to cultural resources due to increased recreational use of the WSA. However, protection afforded by wilderness management would outweigh any poten-

tial vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

The entire 12,635 acres would be closed to recreational ORV use. This would be a continuation of present management under the Grand RMP. ORV closure does not apply to the road up Pritchett Canyon to the main Moab jeep trail. Other areas similar to the WSA are found in other parts of the Grand Resource Area and would not be closed to ORV use; therefore, ORV use would likely not experience an overall decline in the vicinity of the WSA.

If roads for the development of valid mining claims could not be denied, the quality of primitive recreational opportunities would be reduced. Because the likelihood of mineral production is low, the quality of the primitive recreational experience would likely be preserved in the area as a whole.

As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an undetermined increase in primitive recreational use above the baseline rate. Judging from use densities of a number of well known wilderness areas, proposed wilderness areas, and primitive areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites, it is estimated that, following designation, use could be as much as 3,791 visitor days per year (USDI, BLM, 1985). This is 3,691 visitor days over the area's current estimated 100 annual visitor days.

Management provided through a Wilderness Management Plan would attempt to control destructive increases in future recreation use, and the quality of the primitive recreation experience probably would not be negatively affected by the increased use.

WILDERNESS VALUES

Wilderness designation would contribute to the preservation of the area's wilderness characteristics. Under this alternative, the potential for surface-disturbing activities that could impair wilderness values would be reduced through management under VRM Class I (generally allowing for only natural ecological change), through continuation of the ORV closure, and through closure of the entire area to future mineral leasing and location.

No development of leases is foreseen under this alternative. The possible mineral-related surface disturbance would be 40 acres for development of valid mining claims. Mitigation to protect wilderness values would be considered during mining claim development, but road construction and use of motorized equipment could be allowed if there were no reasonable alternatives. There are 2,680 acres of the WSA (21 percent) under mining claims, but the likelihood for mineral development is low. Thus, the impact to naturalness, solitude, and primitive recreation opportunities on the affected areas could reduce these values until satisfactory reclamation was conducted. Overall, under this alternative, wilderness values would be protected.

LAND USE PLANS AND CONTROLS

Wilderness designation would not be consistent with the Grand or San Juan County concept of multiple-use development. Wilderness designation could conflict with development of hydropower under a Bureau of Reclamation withdrawal; however, because of the placement of the withdrawal in the WSA, no conflict is anticipated.

Designation would not conflict with the State policy of maximizing economic returns if State inholdings, including 640 acres (one section) of full estate lands and 135 acres of split estate (State minerals) lands, are exchanged for land outside the WSA. The BLM Grand RMP does not provide for wilderness designation. A decision by Congress to designate the WSA as wilderness would be an amendment to the RMP.

SOCIOECONOMICS

Overall there would be no significant changes in current trends of population, employment, and local income distribution.

Because of restrictions placed on the use of resources under wilderness designation there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 10) as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative.

The potential to find minerals in the WSA is moderate (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Valid existing oil and gas leases and mining claims could be developed but designation would preclude new leases and claims from being established in the WSA. Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they would be with mineral development under the No

Action Alternative. Although the potential to find minerals in the WSA is moderate, the likelihood of their development is low even without wilderness designation due to the area's rough terrain, etc. It is, therefore, estimated that potential mineral-related local income would probably not be significantly reduced by wilderness designation. However, any local income related to assessment of future mining claims would be lost.

Livestock use and ranchers' income would continue as at present with $3,200 of livestock sales and $800 of ranchers' return to labor and investment. Potential improvements for livestock could be foregone along with any resulting increase in ranchers' income. No such potential range improvements have been proposed.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section). Related local expenditures would be small (average of $4.10 per visitor day statewide) and would not be significant to the local communities. Motorized recreational use of the WSA is light (50 visitor days per year). The decrease in related local expenditures would be small and insignificant to both the local economy and individual businesses.

The loss of 7,140 acres now leased would cause an eventual loss of up to $21,420 per year of lease fees to the Federal Treasury. There would also be a potential loss of up to $3,645 annually in Federal revenues from the 1,215 acres that could be leased without designation. In addition to these rental fees, any potential royalties from new lease production could also be foregone.

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Mill Creek Canyon WSA

MILL CREEK CANYON WSA
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MILL CREEK CANYON WSA
(UT-060-139A)

INTRODUCTION

General Description of the Area

The Mill Creek Canyon Wilderness Study Area (WSA) is situated between Moab and Castle Valley, Utah. It is about 7 miles wide (east-west) and 4 miles long (north-south) and contains approximately 9,780 acres of BLM-administered land entirely within Grand County. No State land lies within the WSA; however, four State holdings border the WSA on the north and south. The WSA is bordered on the west by the cliffline of the South Fork Mill Creek drainage; on the north by a cliffline and the Sand Flats Road; on the east by Wilson Mesa and the Manti-LaSal National Forest; and on the south by the Between the Creeks region.

The WSA is characterized by deep canyons and retreating escarpments. Pinyon-juniper and blackbrush are the dominant vegetation species. Mill Creek is a perennial stream that runs adjacent to the WSA along its west boundary.

The WSA has a semiarid climate characterized by hot summers and moderately cold winters. Annual temperatures range from 115 degrees Farenheit (F) to -20 degrees F. Average annual precipitation ranges from approximately 9 to 16 inches. Most precipitation occurs as late summer thunderstorms. Average annual snowfall is between 10 and 20 inches.

Specific Issues Identified in Scoping

General issues pertaining to the WSAs in the Grand Resource Area are discussed in Volume I. Several concerns pertaining to the wilderness study process and/or the environmental analysis process were raised during scoping. These concerns are discussed in the Scoping section of Volume I rather than in individual analyses for WSAs. Nine specific issues pertaining to the Mill Creek Canyon WSA were identified through the public scoping process (USDI, BLM, 1984) and are responded to below:

1. *Comment:* Pre-FLPMA (Federal Land Policy and Management Act) leases should not be cited as a management problem since they will all expire in 1984.

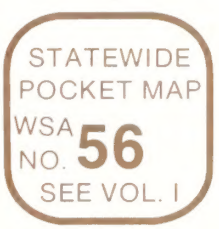
   Response: General management issues of leases are discussed for each alternative in the Environmental Consequences of Alternatives section of this document. Manageability of pre-FLPMA leases in the WSA will also be discussed in the Wilderness Study Reports.

2. *Comment:* Potash and uranium potentials are unimportant considerations, given the availability of other deposits and recognized wilderness values.

   Response: Potash and uranium potential in the WSA is estimated by Science Applications, Inc. (SAI, 1982) to be 1 to 10 million tons for potash and 500 to 1,000 tons of uranium oxide. The potash resource is cited as being well below the surface of the WSA (7,000 feet) and other more favorable areas of potash exist.

3. *Comment:* The Nonwilderness Recommendation decision specified in the Site-Specific Analysis (SSA) is wrong. Conflict of interest of the district wilderness coordinator is an important unresolved issue. The actual reason BLM opposed the wilderness recommendation for Mill Creek Canyon does not appear in the SSA. (The SSA contains arguments to support its untenable position.) For example, management of wilderness is found by the BLM to "be difficult due to lack of cultural or physiographic features." Similarly, management of off-road vehicle (ORV) use is cited as a reason for nondesignation but, mysteriously, this would not pose a problem under the other protection designation proposed in the SSA.

   Response: During scoping for this Environmental Impact Statement (EIS), BLM presented a preliminary indication of areas considered suitable or unsuitable for wilderness designation. For each WSA, this was based on site-specific analysis drafted in one of the five Utah BLM districts. The indication of suitability was made public prior to the EIS to obtain further input which has assisted in the formulation of the EIS alternatives. Additional input is expected as a result of the public review and comment on the Draft EIS. At the conclusion of the EIS process, BLM will review and consider all of the information received and at that time will formulate a final recommenda-



tion of areas found suitable for wilderness designation. Rationale for such recommendations will be included in a Wilderness Study Report to be submitted to the Secretary of the Interior and, subsequently, to Congress. The rationale will be keyed to the criteria of the "Wilderness Study Policy" (USDI, BLM, 1982) and to other resource management factors generally as described in Chapter 2, Volume I of this EIS.

4. *Comment:* Proper study would have revealed that wilderness values override mineral potential.

Response: Refer to the previous response.

5. *Comment:* The BLM is incorrect in concluding that the WSA has a moderate potential for the discovery of oil and gas.

Response: According to SAI (1982), the WSA has the potential for 10 to 50 million barrels of oil and 60 to 300 billion cubic feet of natural gas. Of this, it is estimated that 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas are recoverable. The SAI (1982) report will be used as the reference on oil and gas potential for this EIS, but information provided by the oil and gas industry and available mineral investigation reports by the USDI, Geological Survey and Bureau of Mines will be reviewed by BLM prior to making final wilderness recommendations to the Secretary of the Interior. For more information on the SAI estimates, refer to Appendix 5.

6. *Comment:* The Draft SSA was distorted, depreciated wilderness values, exaggerated resource conflicts, and had erroneous legal references.

Response: Information provided in the SSA was referenced from the Grand Resource Area Resource Management Plan (RMP) (USDI, BLM, 1983) and other technical reports and studies.

7. *Comment:* The management of mineral leases on State land to be exchanged should not be cited as a management problem since the legislation has not been passed.

Response: No State lands are located in the WSA. Five State sections are adjacent to the WSA. Should land transfers be made, it is assumed that management and types of impacts to former State in-holdings would be the same as those on adjacent Federal lands, and no specific analysis is given in this EIS.

8. *Comment:* The existing closure of 720 acres to mineral leasing (RMP decision) is inadequate to protect the area from disturbance.

Response: Oil and gas leasing Category 3 would prevent surface occupancy for development of leases but would not prevent disturbance by development of mineral claims or other resources. This is recognized in the analysis of the No Action Alternative.

9. *Comment:* The Draft SSA failed to mention the fantastic spires and hoodoos in upper Rill Creek and Burkholder Draw and the rare outcrops of the Moab Member of the Entrada Formation, which offer outstanding opportunities for solitude and primitive recreation.

Response: This analysis provides acreage figures for outstanding opportunities of solitude and primitive and unconfined recreation (2,800 acres). Also, examples of these opportunities are outlined in the Affected Environment section. Opportunities for solitude are outlined by size and configuration, topographic and vegetation screening, etc. Specific areas mentioned are the North Fork of Mill Creek in the western half of the WSA and in Burkholder Draw.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated From Detailed Study

During scoping, a Partial Wilderness Alternative was suggested that would eliminate from further study potential energy management conflict areas. However, because the entire WSA has essentially equal potential for oil and gas development, consideration of a Partial Wilderness Alternative would not eliminate potential oil and gas conflicts. Therefore, a Partial Wilderness Alternative is not analyzed for this WSA.

Alternatives Analyzed

Two alternatives are analyzed for this WSA: (1) No Action; and (2) All Wilderness (9,780 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE (PROPOSED ACTION)

Under this alternative, none of the 9,780-acre Mill Creek Canyon WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the Grand Resource Area RMP (USDI, BLM, 1983). No State land is located in the WSA and no State land adjacent to the WSA has been identified in the RMP for special Federal acquisition through exchange or purchase.

The following are specific actions that would take place under this alternative:

- All 9,780 acres would remain open to mineral location, leasing, and sale. Development work, extraction, and patenting would be allowed on the 76 existing mining claims (6,140 acres) and future mining claims. Development would be guided by unnecessary or undue degradation regulations (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases on 3,506 acres of the WSA could be developed under Category 1 (standard stipulations). Future leases could be issued under Category 1 on 9,060 acres and Category 3 (no surface occupancy) on 720 acres.
- The present domestic livestock grazing use in the WSA would continue as authorized in the Grand Resource Area RMP (currently 320 Animal Unit Months [AUMs]). Use of the existing range development (one short fence) would continue. New range developments could be implemented without wilderness considerations as authorized by the proposed RMP. None are presently proposed.
- Use, maintenance, and development of facilities and improvements for wildlife, water resources, etc., could be allowed if in conformance with the proposed RMP. However, none are presently proposed.
- The entire WSA acreage would be limited to ORV use on existing roads and trails, and new access routes for development would not be allowed.
- The entire area would remain open to woodland product harvest. There is no harvest of forest products at the present time, nor is any planned.
- The WSA would continue to be managed as Visual Resource Management (VRM) Class III on 7,820 acres and VRM Class IV on 1,960 acres.
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

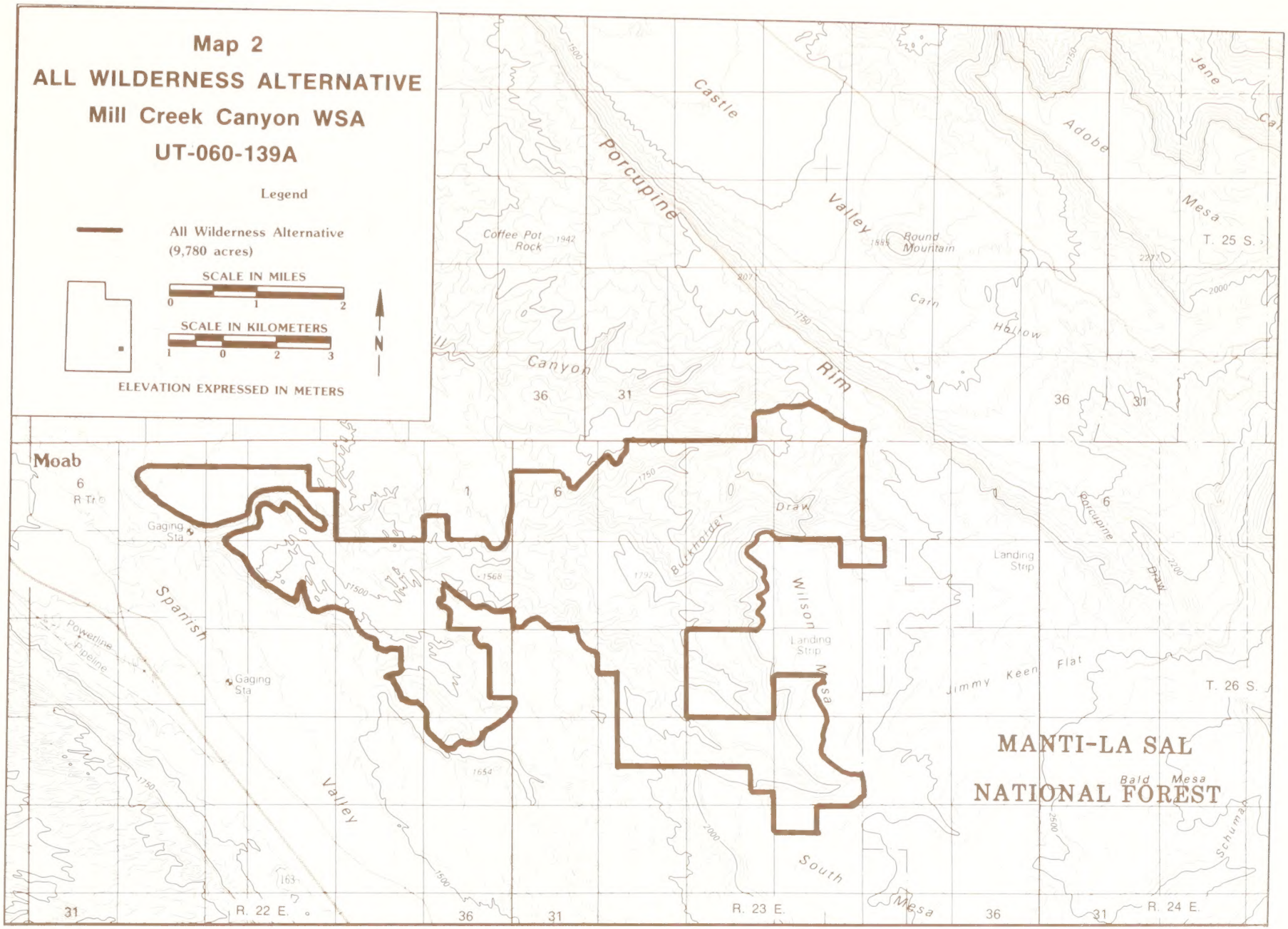
ALL WILDERNESS ALTERNATIVE

Under the All Wilderness Alternative, all 9,780 acres of the Mill Creek Canyon WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. No State lands are located in the WSA; therefore, no State land would be exchanged upon wilderness designation. Also, two of four State sections adjacent to the WSA likely would be exchanged. Should land transfers be made, it is assumed that management and types of impacts to former State in-holdings would be the same as those on adjacent Federal lands and no specific analysis is given here. The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 9,780 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the approximately 6,140 acres of existing mining claims that may be determined to be valid. Development would be guided by unnecessary or undue degradation regulations (43 CFR 3809), with consideration given to wilderness values. Existing oil and gas leases involving 3,506

Map 1
LAND STATUS
Mill Creek Canyon WSA
UT-060-139A
Legend
WSA Boundary
National Forest Boundary
State Land Within or Adjacent to WSA
National Forest Service Administered Land
Private Land Within or Adjacent to WSA
BLM Administered Land Within or Adjacent to WSA
SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
MANTI-LA SAL NATIONAL FOREST
Moab
Spanish Valley
Jane Valley
Adobe Mesa
Round Mountain
Corn Hollow
Rim
Porcupine Draw
Jimmy Keen Flat
Landing Strip
Bald Mesa
Gaging Sta.
Powerline
Pipeline
T. 25 S.
T. 26 S.
R. 22 E.
R. 23 E.
R. 24 E.


Map 2
ALL WILDERNESS ALTERNATIVE
Mill Creek Canyon WSA
UT-060-139A
Legend
All Wilderness Alternative
(9,780 acres)
SCALE IN MILES
0 1 2
SCALE IN KILOMETERS
1 0 2 3
N
ELEVATION EXPRESSED IN METERS
Moab
Castle Valley
Porcupine Rim
Canyon Rim
Coffee Pot Rock
Round Mountain
Adobe Mesa
Jane
Carn Hollow
Buckhorn Draw
Wilson Mesa
Landing Strip
Porcupine Draw
Jimmy Keen Flat
Bald Mesa
Schumaker
South Mesa
Spanish Valley
Gaging Sta
Powerline
Pipeline
MANTI-LA SAL
NATIONAL FOREST
T. 25 S.
T. 26 S.
R. 22 E.
R. 23 E.
R. 24 E.
31
36
1
6

acres would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.

- Present domestic livestock grazing would continue as authorized in the Grand Resource Area RMP. The 320 AUMs in the WSA would remain available to livestock as presently allotted. Use and maintenance of range developments existing at the time of designation could continue in the same manner as in the past based on practical necessity and reasonableness. After designation, new range developments would be allowed on a case-by-case basis if necessary for range and/or wilderness resource protection and management.
- New water resource facilities or watershed activities not related to rangeland or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are located in the Mill Creek Canyon WSA, and none are currently planned.
- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values. None are existing in this WSA, and none are planned.
- The entire 9,780-acre area would be closed to ORV use except for (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. About 4 miles of existing vehicular ways would not be available for vehicular use except as indicated above.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 9,780-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads that are adjacent to or "cherry-stemmed" into the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood if accomplished by other than mechanical means. There is no harvest of forest products at the present time, nor is any specifically planned.
- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial methods.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Hunting would be allowed subject to applicable State and Federal laws and regulations but without the use of motorized vehicles.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Unless otherwise indicated, information for this section was taken from the Grand Resource Area RMP and other BLM technical reports and documents.

Air Quality

The WSA has a Prevention of Significant Deterioration (PSD) Class II air quality classification as per the 1977 Clean Air Act Amendments. The nearest Class I area is Arches National Park, about 3 miles to the northeast. Canyonlands National Park, another Class I area, lies about 13 miles to the southwest. The LaSal Mountains are visible to the east from the WSA. Air quality in the WSA is considered good. Occasionally there is a smog problem in the Moab Valley that could adversely affect views from the WSA, especially the lower end. Generally occurring during winter thermal inversions, sources of smog are reported to be the Atlas Uranium Mill north of town and wood stoves used for home heating in Moab. The smog sometimes lasts for several days. When it dissipates, it generally drains north over Arches National Park. The problem appears to have worsened in recent years due to increased popularity of wood stoves for home heating because of high gas prices. Visual range in the general vicinity averages between 100 and 132 miles during the summer (Aerocomp, Inc., 1984).

Geology

Mill Creek is a drainage system generally trending west to east from the Moab Valley in south-central Grand County, Utah. It is located in the Canyonlands Section of the Colorado Plateau Physiographic Province.

The Mill Creek Canyon WSA is on the west flank of the LaSal Mountains, an unusually small range consisting of laccoliths that have pushed up overlying sedimentary rocks. The uplift formed Wilson Mesa and South Mesa, prominent topographic features at the eastern extreme of the WSA. An area to the west of the mesas generally shows increasingly lower elevation as the observer moves from east to west through the area. However, several streams are present that have formed rather deep canyons (Hintze, 1973).

Topographically, the highest point in the WSA, on the Wilson Mesa flats above the canyons, is 7,000 feet above sea level. The lowest point, near the mouth of Mill Creek Canyon, is about 4,400 feet.

Near the top of the stratigraphic column as exposed in the WSA is the Jurassic Entrada Sandstone. This formation, 200 to 300 feet thick, is white at the top but dark red to the middle and bottom. At the base of the Entrada lies the Dewey Bridge Member, usually about 50 feet thick. Immediately below the Entrada Sandstone is the Navajo Sandstone of upper Triassic and lower Jurassic Age. The Navajo Sandstone is about 200 feet thick here and covers a much larger portion of the WSA than any of the other formations exposed at the surface. The Navajo Sandstone is often cross-bedded and is frequently described as "frozen sand dunes," a petrified dune environment from an ancient desert (Hintze, 1973).

Below the Navajo Sandstone is the Triassic Kayenta Sandstone, about 100 feet thick. The Kayenta is exposed on the surface in only a few locations in the WSA. Below the Kayenta is the Triassic Wingate Sandstone exposed in Burkholder Draw. Formed in an ancient desert environment, the Wingate Formation is similar to the Navajo Sandstone. The Wingate is the lowest formation in the local stratigraphic column which is surficially exposed in the WSA. The Wingate is 200 to 300 feet thick here (Hintze, 1973). This formation forms some of the canyon walls present in the area.

Several sedimentary formations are present in the subsurface of the WSA. In addition, the Tertiary-aged quartz-diorites of the La Sal Mountain laccolith may also be present at a relatively shallow depth in the eastern part of the WSA. Unexposed beneath some of the WSA is the Triassic Chinle Formation, at least 100 feet thick. The Chinle, which consists of numerous shales and sandstones, contains ore grade uranium in many locales south of the La Sal Mountains. Below the Chinle is the Triassic Moenkopi Shale, a marine deposit about 100 feet thick.

Below the Moenkopi is the Cutler Formation, 200 to 300 feet thick mostly sandstones in this area. Below the Cutler some Pennsylvanian-aged Hermosa Group formations are present. This group could be as much as 2,000 feet thick here,

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
MILL CREEK CANYON WSA

Resource	Alternatives	
	No Action (Proposed Action)	All Wilderness (9,780 Acres)
Mineral and Energy Resources	Potential recovery could be achieved for up to 3 to 15 million barrels of oil, 18 to 90 billion cubic feet of natural gas, 1 to 10 million tons of potash, 500 to 1,000 tons of uranium oxide, 50,000 tons of copper, and 100,000 tons of manganese. There is a moderate probability of development.	Oil, gas, and potash likely would not be recovered. Assuming a worst-case analysis, recovery of locatable minerals would also be foregone. There is a moderate probability of development of mineral resources, and significant loss of recoverable oil and gas and minerals could result.
Wildlife	About 8 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.
Livestock	Grazing of 320 AUMs and maintenance of existing developments would continue. New developments could be constructed; however, none are now proposed.	Grazing of 320 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. New developments proposed in the future might not be allowed.
Visual Resources	The quality of visual resources could be impaired on up to 815 acres.	Visual quality could be impaired on up to 85 acres.
Recreation	ORV use would continue on 4 miles of ways at current levels. Overall recreational use could increase from the present 750 visitor days per year to 1,118 over the next 20 years. Up to 815 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including 4 miles of ways, would be closed to ORV use. Primitive recreational use could be as high as 2,934 visitor days per year following wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 815 acres (8 percent of the WSA), which could degrade wilderness values throughout the WSA.	Wilderness values would be protected, except on up to 85 acres (less than 1 percent of the WSA) which may be disturbed by development of valid mineral rights. Overall, wilderness values would probably be protected in the WSA as a whole.
Land Use Plans and Controls	This alternative would be consistent with the *Grand County Master Plan,* and the current BLM Grand RMP. State plans and policies would not be affected.	This alternative would not be inconsistent with the *Grand County Master Plan,* but would be inconsistent with the policies of the Grand County Commission. It would not affect State plans. Designation would constitute an amendment of the BLM Grand RMP.
Socio-economics	Annual local sales of less than $10,235 and Federal revenues of up to $10,966 would continue. An additional $18,822 per year in Federal revenues could be derived from leasing of presently unleased areas.	Annual local sales of less than $10,235 and Federal revenues of up to $448 would continue, but Federal revenues of up to $29,340 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.

although this is not as thick as the same formation to the south and east. The Hermosa Group includes the Paradox Formation of evaporates as well as limestones.

Soils

This WSA contains two general soil mapping units. More specific soils information can be found in the *Canyonlands Soil Survey* (U.S. Department of Agriculture, Soil Conservation Service, 1978). Soils, where present, are generally very shallow; very deep sandy soils have formed where sand has drifted and in canyon bottoms. Soils have predominantly formed from sandstones. The sandy soils are susceptible to wind erosion. Runoff is very rapid due to the high percentage of rock outcrop. Most erosion is natural in origin. Table 2 describes soil characteristics and land types and Table 3 describes erosion condition.

Vegetation

Blackbrush is the dominant single species throughout the WSA. Pinyon and juniper trees are found in varying densities. Big sagebrush is found on the better soils at upper elevations. Other species found scattered throughout the WSA are rabbitbrush, cliffrose, yucca, Mormon tea, snakeweed, snowberry, galleta grass, and Indian ricegrass. A narrow stand of riparian vegetation (628 acres), including cottonwood trees, is found along the North Fork of Mill Creek and that portion of Mill Creek in the southwest corner of the WSA. Table 4 shows the existing vegetation types in the WSA. There are no known sensitive, threatened, or endangered species in the WSA.

The Mill Creek Canyon WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bai-

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Estimated Rate of Erosion (cubic yards/acre/year) Bare Soil Surface
Rock Outcrop	20	1,956	0.0	0
Shallow and deep sandy soils on sloping structural benches and cuestas	55	5,379	1.0	5
Moderately deep to deep stony and loamy soils on steep canyon sides	20	1,956	1.0	10
Very deep loamy soils on gently sloping alluvial fans and floodplains	5	489	0.1	1
Totals	100	9,780		

Source: Hansen, 1985.

Table 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions: Percent of Area	Acres	Cubic Yards	Annual Soil Loss if Disturbed: Percent of Area	Acres	Cubic Yards
Very High	20.0	0	0	0	0	0	0
High	10.0	0	0	0	20	1,956	19,560
Medium	5.0	0	0	0	55	5,379	26,895
Low	1.0	75	7,335	7,335.0	5	489	489
Very Low	0.1	5	489	48.9	0	0	0
None	0.0	20	1,956	0	20	1,956	0
Totals		100	9,780	[1]7,384[1]	100	9,780	[1]46,944[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: .75 under present conditions; 4.8 if disturbed.

ley-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) type of the WSA is juniper-pinyon woodland. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Blackbrush	1,760	18
Blackbrush/Pinyon-Juniper	1,150	12
Blackbrush/Big Sage	500	5
Pinyon-Juniper/Blackbrush	5,092	52
Pinyon-Juniper/Big Sage	650	7
Riparian	628	6
Totals	9,780	100

Source: USDI, BLM, 1972.

Water Resources

The major drainages in this WSA are the North Fork of Mill Creek, Rill Creek, and Burkholder Draw. All drainages generally flow in a westerly direction from their respective headwaters along Porcupine Rim to the northeast and the LaSal Mountains to the east. There are approximately 20 miles of perennial stream present within the WSA. The main branch of Mill Creek flows just outside the southern end of the WSA and continues in a northwesterly direction. The North Fork of Mill Creek joins the main branch of Mill Creek 0.25 mile downstream from the WSA boundary. Approximately 4 miles downstream from this confluence, Mill Creek flows into the Colorado River. The North Fork has the largest drainage area in the WSA, and is a perennial stream for the most part. Burkholder Draw, in the northeast section of the WSA, contains the only perennial spring in the WSA, and it flows to the confluence with Rill Creek. Rill Creek, situated in the north-central section of the WSA, is perennial below the confluence with Burkholder Draw.

A water inventory of the WSA indicated only one undeveloped spring. There are no water wells in this WSA and, therefore, no ground water quality data are available; however, the geologic formations in Mill Creek Canyon WSA have been found elsewhere to yield fresh water to wells. Water quality should be acceptable for recreation, wildlife, livestock, and agricultural uses.

Mineral and Energy Resources

The WSA lies in an area that has previously yielded few, if any, valuable mineral materials. Nevertheless, some undiscovered deposits of potash, manganese, oil and gas, and uranium are possibly present. Also, some placer gold is known to occur in the WSA, although it has never been successfully mined. Each WSA was assessed for its energy and mineral values by SAI (1982). The results are summarized in Table 5. The methodology used in the assessment is summarized in Appendix 5.

TABLE 5
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f3	c2	10 to 50 million barrels of of oil; 60 to 300 billion cubic feet of natural gas
Uranium/Vanadium	f3	c2	50 to 1,000 tons of uranium oxide
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f1	c4	None
Copper	f2	c1	Less than 50,000 tons
Potash	f3	c3	1 to 10 milion tons
Manganese	f2	c1	Less than 100,000 tons

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

An overall importance rating (OIR) of 3 was assigned to the Mill Creek Canyon WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA.

The mineral importance of the WSA will be reviewed by the USDI, Geological Survey and Bureau of Mines as they complete an independent mineral investigation report for the WSA. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and criti-

cal materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. The WSA could contain deposits of vanadium, manganese, and copper that are currently listed as strategic and critical materials (Federal Emergency Management Agency, 1983). Although copper is listed as strategic, it is relatively common and supplies currently exceed demand.

LEASABLE MINERALS

Oil and Gas

The structure in the WSA is conducive for a hydrocarbon trap, especially in the western portion of the WSA. Analagous areas on the flanks of other anticlines have proven to be hydrocarbon traps. SAI (1982) estimates the entire Paradox Basin to hold as much as 1.2 billion barrels of undiscovered, recoverable oil and 3.8 trillion cubic feet of undiscovered recoverable gas, most of it in Pennsylvanianand Mississippian-aged rocks that originated in the Paradox Basin. SAI (1982) estimates that 10 to 50 million barrels of oil and 60 to 300 billion cubic feet of natural gas resources could be located in the WSA. Refer to Appendix 6 for estimates of recoverable resources. Prior drilling in and near the edges of the WSA, however, has been unproductive. Consequently, the SAI has given this WSA a favorability rating of f3 because of the structure, but a certainty rating of c2 because of drilling results.

All of the WSA is open to oil and gas leasing under the BLM category system established in 1975 (USDI, BLM, 1975). To date the WSA has not experienced any serious oil and gas exploration, but interest in leasing and seismic activity continues.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

The WSA contains portions of eight oil and gas leases (four pre-FLPMA, four post-FLPMA) covering about 3,506 acres of the area. Approximately 1,956 acres of the WSA are covered by pre-FLPMA leases which carry valid rights existing at the passage of FLPMA. Post-FLPMA leases (1,550 acres) carry wilderness nonimpairment stipulations. About 6,274 acres are not leased but one is open to oil and gas leasing. Under the BLM oil and gas category system, 9,060 acres of the WSA are classified as open and 720 acres are open with no surface occupancy.

Table 6 shows oil and leasing categories in the WSA, and Table 7 depicts leases as of January 1985.

TABLE 6
Oil and Gas Leasing Categories

Category	Acreage in WSA	Percentage of WSA
1. Open	9,060	93
2. Open with Special Stipulations	0	0
3. Open with No Surface Occupancy	720	7
4. Suspended or No Lease	0	0
Total	9,780	100

Source: USDI, BLM, 1975.

TABLE 7
Oil and Gas Leases

Type	Acreage in WSA	Percentage of WSA
Pre-FLPMA leases	1,956	20
Post-FLPMA leases	1,550	16
Available for lease	6,274	64
Total	9,780	100

Source: USDI, BLM, 1975.

Coal

SAI assigned coal a rating of f1/c4 in the WSA because the geology is not favorable for coal and no coal resources are known to exist.

Potash

The same anticline structure discussed in the oil and gas section could also contain a potash resource. The potash-bearing formation is thickest and nearest to the surface at the crest of the anticline. The western edge of the WSA parallels the crest; however, the potash-bearing zones under the WSA which contain an estimated 1 to 10 million tons of in-place resource are estimated to be well below 7,000 feet. No lands in the WSA are under lease for potash. The SAI report assigned a rating of f3/c3 to the WSA for potash.

LOCATABLE MINERALS

Mining claims for both lode or bedded deposits (uranium in this area) and placer gold deposits are present in the WSA. There are a total of 76 mining claims covering approximately 6,140 acres of the WSA. All 76 mining claims had current assessment work as of July 1983. Presently, no locatable minerals are being mined in the WSA.

The eastern extreme edge of the WSA is on the physiographic feature known as Wilson Mesa. Geologic literature has long reflected the presence of placer gold on Wilson Mesa, although the SAI report did not address the topic. This particular placer deposit is of glacial origin. Since no water is available, gold recovery is difficult, though miners have attempted mining over the years.

Uranium/Vanadium and Copper

The same structural setting on the flank of the faulted anticline favorable to hydrocarbons and potash also relates to uranium/vanadium. In the Lisbon/Big Indian Valley about 30 miles southeast of the WSA and in the Uravan Mineral Belt in western Colorado, uranium is found in economic quantities on the flanks of salt anticlines.

The uranium is present in the Jurassic Salt Wash Member of the Morrison Formation in the Triassic Mossback Member of the Chinle Formation and in the Permian Cutler Formation. The Cutler and Chinle Formations are present in the subsurface over the entire WSA. SAI assigned uranium a rating of f3/c2; an f3 because Chinle and Cutler Formations are present, but a c2 rating because of the unexposed state of these strata.

On the Colorado Plateau in eastern Utah, only small amounts of by-product copper have been produced from sandstones that have been mined for uranium and vanadium..

Copper production from the Moab District has come largely from four areas: (1) near the Town of Moab; (2) the Big Indian/Lisbon Valley area; (3) the White Canyon area; and (4) the Monument Valley area. The deposits are confined chiefly to the Chinle Formation of Triassic age, particularly the Shinarump Member. Cumulative copper output from each of the four areas has been far less than 50,000 tons.

The Chinle and other redbed sandstones throughout the Colorado Plateau (and in the vicinity of the Mill Creek Canyon WSA) are not very favorable for large or even moderate accumulations of copper. Nevertheless, copper occurs widely throughout the Plateau and there is a low potential for less than 50,000 tons of copper. The certainty that copper resources occur in the Mill Creek Canyon WSA is low and the WSA has been assigned a value of c1.

Manganese

The chief host rocks for manganese in this region—the Morrison and Summerville Formations-have been eroded from Mill Creek Canyon WSA. The less favorable Chinle Formations occur a few hundred feet below the tract; on this basis, the WSA has been assigned a favorability rating of f2 and a certainty of resource occurrence of c1. SAI (1982) estimates a potential in-place resource of less than 100,000 tons of manganese in the WSA.

SALABLE MINERALS

Salable minerals are not known to exist in the WSA.

Wildlife

Mill Creek Canyon provides habitat for a variety of wildlife species. Mule deer, elk, coyotes, bobcats, desert cottontail rabbits, chukar partridge, and a variety of reptiles, amphibians, and rodents may be found in the WSA. Several species of raptors and song birds also inhabit the area. Cougar and black bear may occasionally visit the area.

Wildlife habitat types in the WSA include 628 acres of riparian vegetation along a perennial stream with several forks or tributaries, sandstone walls and fins, and an upland pinyon-juniper sagebrush vegetation community.

The most common big game species is mule deer, which are found in small numbers. Mule deer winter range is provided in the pinyon-juniper sagebrush vegetation community for approximately 77 deer (77 AUMs) each year. About 5 mule deer (12 AUMs) inhabit the perennial stream and riparian habitat areas yearlong. About 5,580 acres of

crucial deer winter habitat are located in the WSA. The WSA is entirely within the Utah Division of Wildlife Resources (UDWR) Deer Herd Management Unit 30A. Approximately two elk (10 AUMs) winter in the pinyon-juniper sagebrush habitat type.

Upland game species include mourning dove, desert cottontail rabbit, and chukar partridge. Mourning dove are common during the summer months and their nests are located throughout the WSA. Cottontail and chukar are common yearlong residents.

There are several species of snakes, lizards, and amphibians in the WSA. The most common are horned lizards, Great Basin sagebrush lizard, Northern Plateau lizard, Northern tree lizard, side-blotched lizard, whiptail lizard, collared lizard, gopher snake, striped whipsnake, and midget faded rattlesnake. Most of these can be found throughout the WSA. Red-spotted toads and Western spadefoot toads are common in the stream and riparian habitat types.

Fish species in Mill Creek are fathead minnows, red shiners, mottled sculpin, roundtail chub, and green sunfish. The stream habitat is composed of a series of pools, ripples, and cascades. Many of the pools have a maximum depth of more than 2 feet and provide excellent resident fishery habitat. Macroinvertebrate samples in Mill Creek indicate a good range of species diversity and a high standing crop (numbers). Primary species present are tolerant to sedimentation. Tadpole shrimp and fairy shrimp are present in slow-moving or standing water and in numerous pot holes in solid sandstone.

The most common birds in the WSA are canyon wrens, rock wrens, redtailed hawks, golden eagles, great horned owls, kestrels, prairie falcons, ravens, pinion-jays, flickers, and rock doves. These species are common year-round. Summer visitors are robins, broadtailed hummingbirds, yellowrumped warbler, yellow warblers, killdeer, violetgreen swallows, kingbirds, flycatchers, and many others. Summer species diversity of songbirds is high near the perennial stream in the riparian habitat where some nests may be found.

Cliffs, fins, ledges, crevices, and holes in the cliff faces also provide perches and nesting habitat for hawks, eagles, owls, falcons, and various other small nesting birds. Small mammals and bats also depend on these cliffs, ledges, and crevices for cover and nest sites.

The American peregrine falcon and the bald eagle are the only threatened or endangered species that may occasionally visit the area. There are no known falcon eyries or eagle nests in the area. The golden eagle is a sensitive species known to inhabit the WSA.

There are no existing or proposed wildlife habitat improvements or wildlife transplants proposed for the WSA.

Forest Resources

The WSA does not possess commercial timber. The noncommercial pinyon-juniper woodland provides a source of firewood to neighboring residents; however, there is no commercial firewood cutting. Noncommercial woodland harvest is minimal.

Livestock and Wild Horses/Burros

The Mill Creek WSA contains portions of three allotments. One of these (Bald Mesa) is administered by the Forest Service because of its proximity to the Manti-LaSal National Forest. Due to steep topography and a lack of forage, there are no AUMs in the lower portion of the Bald Mesa Allotment which is located in the WSA. Table 8 gives livestock grazing use data for the WSA.

Since the WSA incorporates the rockiest portions of South Sand Flats and Between the Creeks Allotments, the percentage of AUMs within the WSA is less than what the acreage would indicate. It is estimated that 80 AUMs are within the WSA for Between the Creeks Allotment and 240 AUMs for the South Sand Flats Allotment. The only range development of record is a short fence near the North Fork of Mill Creek. No vegetation manipulation is planned in the WSA. There are no developed water sources and none are planned. No wild horses or burros are found in the WSA.

Visual Resources

The WSA is located in an area which was inventoried and evaluated with the BLM's VRM system in 1980. This work, as well as data obtained during the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980), serves as a reference for this report.

The WSA is 80 percent Class B and 20 percent Class C scenery, with high and low sensitivity levels and foreground/middleground distance zones.

The major landscape feature of the WSA is the diversity of landforms. Topography varies from narrow, sheer-walled canyon drainages with perennial streams to flat to gently rolling toplands. Massive sandstone outcrops are found through-

Table 8
Livestock Grazing Use Data

Allotment	Season of Use	Number of Livestock	Number of Permittees	Total Number of AUMs	Number of AUMs in WSA
Between the Creeks	10/27 to 04/30	490 cattle	1	221	80
South Sand Flats	11/01 to 04/30	300 cattle	3	592	240
Bald Mesa[1]	06/01 to 10/31	834 cattle	1	0	0
Totals				813	320

Source: USDI, BLM, 1972.

[1]Administered by Forest Service.

out the WSA in the form of fins, ridges, domes, spires, and balanced or capped rocks. The predominant landform colors are dark reds, pinks, and greys. Textures vary from smooth to coarse.

Vegetation consists primarily of open stands of pinyon-juniper trees with desert shrubs. Riparian vegetation (willow, cottonwood, tamarisk) can be found along canyon drainages.

The VRM class indicates the degree of acceptable visual change within the characteristic landscape. The WSA has 7,820 acres of VRM Class III and 1,960 acres of VRM Class IV. Appendix 7 explains the BLM's VRM rating system.

Cultural Resources

Historic and prehistoric remains represent a substantial part of the recreation values of the Mill Creek Canyon WSA. Although no completed inventory exists, at least 25 prehistoric sites are documented and a high probability exists for finding additional sites in the WSA. These include rockshelters, lithic manufacturing, and campsite locations of uncertain date, although several are either Archaic or Basketmaker II sites. Cultures represented in the region include the Paleo-Indian, Desert Archaic, Fremont, and possibly Anasazi, Ute, and historic European.

European influence in the region dates from the Dominquez-Escalante Expedition of 1776 followed by Mexican traders on the Old Spanish Trail and French fur trappers in the 1810 through 1840 era. American explorers crossed the region just north and southwest of the WSA in the 1850s, and ranching spread to the WSA by the 1890s. Use of the WSA was made mostly from a ranch based in Moab and Castle Valley.

No known or nominated National Register sites occur in the WSA, although several have potential.

Recreation

There are no documented use statistics for the Mill Creek Canyon WSA; however, the area is considered a popular local recreation spot. Present use levels are increasing. North Fork Mill Creek, a colorful sandstone canyon with a perennial stream, is the principal scenic attraction, providing hiking, backpacking, and backcountry camping opportunities. Recreation opportunities within the Mill Creek Canyon WSA are found in the canyon drainages, Between the Creeks, and Wilson Mesa area. Hikers frequent North Fork of Mill Creek because of the perennial stream and scenic red rock formations. Recreational hiking and swimming amount to about 500 visitor days per year.

Local recreation use (swimming holes) appears to be pretty much confined to the mouth of the canyon and in the North Fork a short distance above the confluence of the North and South Forks of Mill Creek.

Old seismograph lines in and around the perimeter of the WSA and in the Between the Creeks area provide access for four-wheel drive vehicles. Scenic sandstone fins and canyon scenery is made available to the public in this manner. Visitor days by ORVs in the WSA are estimated at 250.

An access road to the WSA loops through private land at Hidden Valley Ranch near the Moab Golf Course and around to Flat Pass near Ken's Lake. Access is restricted at the private land by a gate which is occasionally locked. A bypass road has

been constructed into Mill Creek. This would not be in the WSA, but it would be visible from areas in the WSA. Vehicle use does not appear to be heavy on these trails. The route is used as an annual Jeep Safari route (known as Steel Bender). Forty-one vehicles made the trip in the 1983 Safari. About 4 miles of ways are found in the WSA. The entire 9,780 acres have been identified in the Grand Resource Area RMP for designation as an ORV limited use area, with use limited to roads and trails.

Wilderness Values

SIZE

The WSA is of sufficient size (9,780 acres of BLM-administered land) to enhance wilderness values present. It is 7 miles long (east-west) and 4 miles wide (north-south).

NATURALNESS

All 9,780 acres of the WSA remain essentially natural in character. An old trail was bladed into Rill Creek; however, it fades out as it reaches the bottom of the drainage. The road becomes a cattle trail that continues downstream and then enters the North Fork of Mill Creek. Evidence of conventional seismic activity can be found in the southwest portion of the WSA between Mill Creek (outside of the WSA) and the North Fork of Mill Creek. Seismic lines total 3 miles in length. Placer mining has occurred recently near Wilson Mesa. Overall, there are 4 miles of vehicular ways in the WSA. All intrusions are substantially unnoticeable.

SOLITUDE

The WSA offers outstanding opportunities for solitude within portions of the unit due to the variety of topography present.

The area does not give the visitor a feeling of vastness. The configuration of the WSA is of considerable importance in assuring protection of the wilderness values. The WSA is basically shaped like an hourglass, the center being constricted down to about .50 mile in width. Mill Creek is not included in the WSA but instead is adjacent to the western boundary of the WSA. A constriction is also found along the west side where the unit narrows down to about .50 mile. Private land on Wilson Mesa intrudes into the eastern portion of the unit creating two legs, one encompassing the North Fork of Mill Creek and one encompassing Burkholder Draw to the north. The Mill Creek constriction narrows to .50 mile for a distance of .75 of a mile. The narrow constrictions inhibit the ability to protect existing opportunities for solitude from potential uses outside the WSA.

Sheer canyon walls provide vertical separation and screening. The depth and winding nature of the canyon enhances topographic screening. In the eastern half of the canyon, the cliff walls become less sheer, with several side canyons branching off the main drainage. Vertical separation is not so pronounced. The winding nature of the eastern half of the canyon also provides some screening. The side canyons that branch off the main drainage provide additional topographic screening. Topographic screening is also provided by sandstone fins in the western part of the unit near the canyon mouth. The upper elevations of the unit consist primarily of wind-blown sand and sandstone formations. Some topographic screening is also provided by this uneven terrain but is less than outstanding. Narrowness of the canyon can detract from the solitude when many people are in the area by limiting their opportunity to avoid each other; however, present use does not appear to create this conflict.

Significant vegetation screening is provided by riparian vegetation along Mill Creek Canyon and from moderately dense pinyon-juniper growth in the eastern portion of the WSA. Vegetation screening does diminish in the canyon bottom in the upper portion of Mill Creek and is absent in slickrock and low brush and grass-covered areas.

Solitude is limited in the central, southwestern, and southeastern portions of the unit where the WSA is constricted to areas of .50 mile. The area of outstanding solitude is principally associated with the North Fork of Mill Creek in the western half of the WSA. This area, combined with the nearby redrock fins, comprises about 2,800 acres of outstanding solitude opportunities.

Sights and sounds of human activity outside the WSA are present from some locations within the WSA. The western edge of the WSA borders Mill Creek and, in places, comes close to housing developments in Moab in the vicinity of Kayenta Heights and the Highlands. Agricultural activities exist in Mill Creek on private land adjacent to the WSA. Vehicle noise from either of these sources can be heard from portions of the WSA. The Sand Flats Road provides a portion of the northern boundary of the WSA. Traffic on this road is visible and can be heard from within the WSA. Distant sounds of trucks can be heard from U.S. Highway 191 echoing off the cliffs paralleling the highway.

A visitor would have no problem finding a se-

cluded spot in the North Fork of Mill Creek and in Burkholder Draw. The constrictions in the central, southwestern, and southeastern portions of the WSA could impede the ability to find seclusion in those areas.

In summary, a 2,800-acre portion of the WSA meets the outstanding criterion for solitude. The balance of the WSA, 6,980 acres, does not meet the outstanding criterion for areas under wilderness review.

PRIMITIVE AND UNCONFINED RECREATION

Portions of the canyon provide outstanding opportunities for hiking, camping, backpacking, and nature study. Sandstone fins near the mouth of the canyon also provide outstanding recreational hiking opportunities. The colorful sandstone formations offer excellent photographic opportunities. The area is of limited value for hunting and fishing because of low game populations.

In summary, recreation opportunities meet the outstanding criterion in over 2,800 acres (30 percent of the WSA) (the canyon and fins areas) and do not meet the standard in the remaining 70 percent of the area (6,980 acres).

SPECIAL FEATURES

Mill Creek is one of the few side drainages to the Colorado River in Utah that contains a perennial stream. This is of particular significance when considering its proximity to the community of Moab, making it easily available for public use. The WSA possesses several prehistoric sites of value as well.

Land Use Plans and Controls

No rights-of-way, private land, or subsurface rights exist in the WSA. There are no State inholdings within the WSA. Four State sections managed by the State Land Board border the WSA on the north and east.

The WSA is managed by BLM's Grand Resource Area RMP (USDI, BLM, 1983). The area is currently managed for multiple use (refer to the No Action Alternative discussion). The Grand Resource Area RMP has been reviewed by the Governor of Utah and found to be consistent with State plans.

The WSA lies entirely within southern Grand County. The current *Grand County Master Plan* (University of Utah, Bureau of Community Development, 1979) does not favor wilderness but does recognize the value of "areas of critical environmental concern," specifically mentioned in the plan. This area is specifically mentioned as an area of critical environmental concern needing further studies for wilderness and resource values. The Grand County Commission generally opposes wilderness designation in Grand County.

Socioeconomics

DEMOGRAPHICS

The WSA is located in southern Grand County, with the western boundary only .5 mile from the community of Moab, which is the main gateway to the WSA. The socioeconomic effects of wilderness designation or nondesignation would be primarily confined to the Moab area. Grand County can be characterized as rural and sparsely populated. The 1982 county population was 8,100, less than 1 percent of the State population of about 1.5 million (Utah Office of Planning and Budget, 1984). The majority of the county is unpopulated, with 97 percent of the settlement concentrated in or near Moab and about 65 percent of the county's population actually living in Moab.

About 80 percent of the county is owned by the Federal Government, 15.5 percent by the State, and 4.5 percent by private landowners.

EMPLOYMENT

Recent statistics show that 99 percent of local wage and salary employment is nonfarm. About 17 percent employment is in Federal, State, and local governments. Federal employees account for somewhat less than half of this (U.S. Department of Commerce [USDC], Bureau of Economic Analysis, 1983). Mining and tourism are the most important private industries in Grand County. Mining directly accounts for 25 percent of local employment; however, recent mining and milling layoffs may reduce mining's local importance. Tourism directly accounts for approximately 12 percent of local employment. The mining and tourist industries purchase some of their supplies locally, and those who work in these industries spend part of their income locally. This circulation of money from export industries contributes to local income and employment. Including these multiplier effects, mining and tourism account for 35 to 45 percent and 17 to 25 percent of local employment, respectively. Unemployment in the county is among the highest rates in the State with the 1983 first quarter figures of almost 18 percent. This is primarily due to large mine layoffs and the resulting downturn through the local economy. Table 9 shows 1981 income and employment for Grand County.

TABLE 9
1981 Income and Employment
Grand County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	1	Less than 1
Total Agriculture	1	Less than 1
Mining	34	25
Construction	7	5
Manufacturing	1	Less than 1
Transportation and Public Utilities	10	8
Wholesale Trade	10	8
Retail Trade	10	18
Finance, Insurance and Real Estate	3	2
Services	11	16
Other	-	-
Total Private Industry	85	82
Federal Government	5	6
State and Local Government	9	10
Total Government	14	17
Total Nonagricultural	99	99
Unemployment (1st Quarter, 1983)		18
	(Dollars)	(Jobs)
Total Employment and Earnings	$52,753,000 $75,404,000	3,617

Sources: USDC, Bureau of the Census, 1983; Utah Department of Employment Security, 1983.

Note: Because of rounding, numbers are not additive. Total and percentage income figures include wage, salary and proprietors' income. Employment percentage figures include only wage and salary employment. The relative importance of farm equipment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services.

INCOME AND REVENUES

Activities in the WSA that could be of any local economic consequences include mineral exploration, livestock production, and dispersed recreation. Table 10 summarizes local sales and Federal revenues from the WSA.

There has been some sporadic exploration for gold that has provided some temporary local employment (less than 1 work year). The WSA has 76 mining claims that appear current in assessment work. Law requires a $100 annual expenditure for labor and improvements. Some of these expenditures are made within the local economy.

Four operators have grazing privileges in the WSA. An estimated 320 AUMs of forage are consumed by livestock in the WSA (average use). This forage contributes an estimated $6,400 of livestock sales of which an estimated $1,600 returns to local ranchers.

Some woodland products have been harvested from the WSA for private use; however, the harvests have been small and are insignificant to the local economy and only of minor significance to those involved in the harvest.

The WSA's motorized and nonmotorized recreational and related local expenditures are low. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for Mill Creek Canyon WSA is estimated as about 750 visitor days per year. Only a portion of the expenditures for recreational use of the WSA contributes to the local economy of Grand County.

The WSA generates Federal revenues from mineral leases and livestock grazing fees (refer to Table 10).

Oil and gas leases in the WSA cover approximately 3,506 acres. At $3 per acre, lease rental fees generate up to $10,518 of Federal revenues annually. Half of these monies are allocated to the State, which then reallocates these revenues to various funds, the majority of which are related to energy development and mitigation of local impacts of energy and mineral development.

Average actual livestock use and, therefore, revenues generated from grazing in the WSA are unknown; however, the permittees in the WSA can use up to 320 AUMs per year. Based on a $1.40 per AUM grazing fee, the WSA can potentially generate $448 of grazing fee revenues annually, 50 percent of which would be allocated back to the local BLM district for the construction of rangeland improvements.

TABLE 10
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Mining Claim Assessment	Less than $760	None
Oil and Gas Leases and Production	None	$10,518
Livestock Grazing	$6,400	$448
Recreational Use	Less than $3,075	No commercial permits
Total	Less than $10,235	Up to $10,996

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total income that would be generated by these expenditures.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for all Alternatives

1. The alternatives would be carried out as noted in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and, then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable energy resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative (Proposed Action)

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown, but would probably be low due to the WSA's rough terrain. The following is a worst-case analysis based on the assumption that minerals would be developed some time in the future and cause the following disturbance: oil and gas, 310 acres; manganese, 45 acres; potash, 420 acres; and uranium, 40 acres. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed by the State of Utah as a PSD Class II area. Disturbance of 815 acres would result in increases in fugitive dust emissions. Because no major sources of air pollutant emissions are proposed in the vicinity of the WSA, air quality would remain essentially as at present.

GEOLOGY

No impacts to geology are expected because surface disturbances associated with locatable minerals, potash, and oil and gas exploration and development activities would probably not exceed 815 acres. The disturbance would probably be in the form of roads and drill pads, which would not significantly alter the geological character of the WSA.

SOILS

It is estimated that up to 815 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present in undisturbed areas is estimated to be about .75 cubic yard/acre/year. In areas of soil disturbance, estimated soil loss would be 4.8 cubic yards/acre/year (refer to Table 3). Soil loss on the 815 acres would increase from 611 cubic yards/year to 3,912 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined. Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 3,301 cubic yards (45 percent) over current annual soil loss (7,384 cubic yards) to approximately 10,685 cubic yards per year.

VEGETATION

The anticipated maximum of 815 acres disturbed would not result in a major change in any vegetation type in the WSA. Riparian areas are located in canyon drainages and surface disturbance is unlikely in these areas except for occasional stream crossings. There are no known sensitive, threatened, or endangered plant species in the WSA.

WATER RESOURCES

Depending on the location of the anticipated 815 acres of surface disturbance (8.3 percent of the total WSA), short-term increases in TDS and sed-

iment load in the North Fork of Mill Creek, Rill Creek, and Mill Creek (located just outside of the WSA boundary) could occur. However, the increase of 3,301 cubic yards of annual soil loss would not be expected to be significant over the long term. Lease stipulations and the no surface occupancy lease category would aid in protecting surface water resources. No impacts to ground water resources would be expected. No water developments or improvements have been identified for the WSA.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Oil and gas categories in the WSA would remain the same (9,060 acres open and 720 acres open with no surface occupancy). The wilderness stipulations on post-FLPMA leases would be lifted. Some 6,274 acres would be available for lease.

The WSA is estimated to have 10 to 50 million barrels of oil and 60 to 300 billion cubic feet of natural gas in-place. Of this amount, 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas are considered recoverable. These oil and gas resources could be explored and developed without concern for wilderness values. Favorability for the occurrence of oil and gas in Mississippian Formations is moderate for the WSA; however, drilling activities surrounding the WSA have not resulted in any oil and gas discoveries. If oil and gas development were to occur, up to 310 acres of surface disturbance could result.

Potash

The entire WSA would remain open to potash leasing. The potash-bearing zones under the WSA are estimated to be well below 7,000 feet. The likelihood of the WSA being explored or developed for potash at these depths in the Paradox Basin is remote considering that more favorable areas exist elsewhere in the Basin. However, if the resource were developed, it would result in a surface disturbance of up to 420 acres.

Locatable Minerals

Locatable mineral development could occur within the WSA. The entire 9,780 acres would remain open to mining claim location. Potential deposits of 500 to 1,000 tons of uranium oxide, less than 50,000 tons of copper, and less than 100,000 tons of manganese could be developed. Development of these locatable minerals would result in surface disturbance on up to 85 acres. Rugged terrain characteristics of the WSA would increase the cost of subsurface exploration or development.

WILDLIFE

Wildlife could be adversely affected by possible surface-disturbing activities (815 acres) and ORV use. Surface-disturbing activities could possibly occur within 5,580 acres of deer winter range or 628 acres of riparian habitat. Adverse impacts (if any) would be short term while work was ongoing, and habitat could be enhanced over the long term by reclamation and revegetation. Wildlife species could be forced to relocate if riparian habitat or winter range were disturbed, and might or might not return after activities cease. The 815 acres of possible surface disturbance would represent about 13 percent of the total deer winter range and riparian acreage in the WSA. The current deer population in the WSA is estimated at 89 animals (refer to Affected Environment section). Assuming that deer are evenly distributed throughout the winter range and riparian areas in the WSA, the carrying capacity for deer would be reduced by approximately two animals. No other wildlife species would be expected to be impacted by implementation of the No Action Alternative. The bald eagle and peregrine falcon (endangered species) could occasionally utilize the WSA. The golden eagle (sensitive species) is known to use the area. Before authorizing surface-disturbing activities, BLM would conduct site- specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be preserved with the No Action Alternative. Wildlife transplants would be allowed; however, none are planned for this area.

FOREST RESOURCES

Occasional use of firewood by campers and hikers occurs in the woodland area of the WSA. Up to 815 acres of surface disturbance is anticipated. Because of the limited nature of the resource, no significant loss of forest resources is anticipated. The entire area would remain open to noncommercial woodland product harvest; however, there is no harvest of forest products at the present time, nor is any planned.

LIVESTOCK

Domestic livestock grazing would continue as authorized in the Grand Resource Area RMP. The

320 AUMs currently allocated in the WSA are controlled by four livestock permittees. Additional roads or other facilities for livestock handling could be proposed and developed in the future without regard for wilderness values. Existing range facilities (one short fence) could be maintained by mechanical methods. Since motorized vehicles are currently used very little to manage livestock in the WSA, few, if any changes in livestock management techniques are expected. New range developments could be implemented without wilderness considerations, although none are planned. Overall, no change in livestock management would result in the WSA.

VISUAL RESOURCES

Under this alternative, visual quality in the WSA would continue to be protected by limitations placed on potential surface-disturbing activities (i.e., ORV use would be limited to existing roads and trails in the entire 9,780-acre area and oil and gas leases on 720 acres would contain a no surface occupancy stipulation).

However, under this alternative, up to 815 acres would be used for mineral-related exploration and development. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. VRM objectives would probably not be met in VRM Class III areas during the short term. Even after rehabilitation, some permanent localized degradation would be expected. If roads, vehicular ways, and drill pads are located throughout the area (worst-case analysis), visual quality could be reduced in the WSA as a whole. VRM Class IV management objectives would probably be met on the 1,960 acres.

CULTURAL RESOURCES

Protection of cultural values would continue as currently provided. There is a potential for 815 acres of surface disturbance by mineral exploration and development under this alternative; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance. Inadvertent loss or damage could occur in the disturbed areas. The overall effect on cultural resources is unknown, but would probably be minimal. Vandalism could be a problem and would increase in proportion to visitor increase. There are no existing National Register sites within the WSA; however, some of the sites do have National Register potential.

RECREATION

ORV use would be limited to existing roads and trails in the entire WSA. ORV visitor use in the WSA is estimated at 250 visitor days per year.

Primitive recreation values would be foregone in those areas where potential mineral and energy surface-disturbing activities could take place (815 acres). Recreation opportunities (i.e., hiking, hunting, and ORV use) would be expected to increase in popularity as new access is developed.

The future increase in recreational use of the WSA is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use is expected to increase from 750 current visitor days per year to 1,118 visitor days at the end of 20 years. Assuming that the 2-percent increase would be uniform among all recreation uses in the WSA, primitive recreational use would increase from the estimated current use of 500 visitor days per year to about 745 visitor days per year over the next 20 years. Likewise, recreational activities utilizing vehicular access (ORV play, hunting, sightseeing, etc.) would increase from 250 visitor days per year to 373 visitor days.

Commercial outfitting opportunities would not benefit. Eventually, primitive recreational use could decline as vehicular use increased.

WILDERNESS VALUES

None of the 9,780-acre area would be designated wilderness, and management would be under the Grand Resource Area RMP. Under this alternative, wilderness values in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., about 9,780 acres would be limited to ORV use of existing roads and trails and 720 acres would be open to leasing with a no surface occupancy stipulation).

However, under this alternative, 815 acres of mineral exploration and development are possible. The related surface disturbance would result in a significant loss of naturalness (9,780 acres), outstanding solitude (2,800 acres), and outstanding primitive and unconfined recreation (2,800 acres) if roads and drill pads are located throughout the area. The potential for mineral development and related disturbance is moderate in this WSA.

LAND USE PLANS AND CONTROLS

The *Grand County Master Plan* identifies this area as one of critical environmental concern needing further studies for wilderness and resource values. Implementation of this alternative with appropriate controls, as specified in the Grand Resource Area RMP, would be generally consistent with the Grand County Plan. The No Action Alternative would be consistent with plans and policies of the State of Utah which emphasize economic return. However, no State of Utah lands are located in the WSA. The WSA is currently managed under the Grand Resource Area RMP which does not provide for wilderness designation. Therefore, implementation of the No Action Alternative would be in conformance with the RMP. Plans of other agencies would not be affected.

SOCIOECONOMICS

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the oil and gas, uranium/vanadium, potash, manganese, and copper in the WSA were developed, it could lead to a significant increase in employment and income for Grand County. The probability of economic development of minerals within the WSA is moderate (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the existing grazing use (320 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase from 750 to 1,118 visitor days over the next 20 years and overall recreation-related expenditures average $4.10 per visitor day (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA would likely not be significant to the local economy.

Federal and State revenues would not be reduced by this alternative. There are 6,274 acres in the WSA open to oil and gas leases currently not leased. If leased, they would bring up to $18,822 additional Federal lease fee revenues in addition to new royalties from lease production. Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees ($448 per year) would continue.

All Wilderness Alternative (9,780 Acres)

As discussed in the Description of the Alternatives section, major changes that could occur in the area would be related to its withdrawal from mineral location and closure to new mineral leasing and sale. The entire area would be placed in Category 4 (closed to leasing). About 4 miles of existing vehicular ways would be closed to vehicular use, except on approval by BLM, as discussed in the Description of the Alternatives section.

For the following analysis it is assumed that existing mining claims would eventually be explored and developed, resulting in an estimated 85 acres of disturbance within the WSA. It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing would not be allowed. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates for the WSA).

Because potentially disturbed areas would be smaller than under the No Action Alternative (85 vs. 815 acres), the impacts from development and surface disturbance on air quality, geology, vegetation, forest, and cultural resources under the All Wilderness Alternative would be insignificant. Wilderness designation would provide additional protection to these resources as compared to the No Action Alternative. Other effects on these resources due to changes in management are discussed below.

SOILS

It is estimated that up to 85 acres of soil could be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be .75 cubic yard/acre/year. The average rate of soil loss on disturbed areas in the WSA is estimated to be 4.8 cubic yards/acre/year. Soil loss in the disturbed areas would increase from 64 cubic yards/year to 408 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined.

Therefore, under this alternative, maximum annual soil loss within the WSA would increase by approximately 344 cubic yards over current annual soil loss.

WATER RESOURCES

Depending on the location of the 85 acres of sur-

face disturbance considered possible under this alternative, short-term increases in TDS and sediment load in the perennial streams could occur in the WSA. However, this would be a short-term, temporary impact that would not significantly impact surface water resources in the WSA. No impacts to ground water resources would be expected. Construction of new reservoirs or other water developments would not be allowed in the WSA.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Exploration for and development of a potential resource of up to 50 million barrels of oil in-place and up to 300 billion cubic feet of natural gas (up to 15 million barrels of oil or 90 billion cubic feet of natural gas recoverable) could be foregone under this alternative.

Approximately 3,506 acres (1,956 acres pre-FLPMA and 1,550 acres post-FLPMA) are under oil and gas leases. No exploration or development of oil and gas is presently occurring within the WSA. Existing pre-FLPMA and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that these existing leases will be developed or a showing of commercial quantities made prior to their expiration dates. Expired leases will not be reissued.

Potash

It is assumed that between 1 and 10 million tons of in-place resource could be foregone because the area could not be leased for potash. However, the potash-bearing zones under the WSA are estimated to be well below 7,000 feet. The likelihood of the area being explored or developed is remote due to more favorable areas elsewhere.

Locatable Minerals

Approximately 6,140 acres are under mining claim within the WSA, principally for uranium. Less than 100,000 tons of manganese, 500 to 1,000 tons of uranium, and 50,000 tons of copper could occur in the WSA and could be foregone under this alternative. Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation under unnecessary or undue degradation guidelines. If minerals are on claims located prior to wilderness designation, it is estimated that up to 85 acres could be disturbed due to exploration and development of the locatable mineral resource. The worst-case impact to minerals would occur if the potentially recoverable minerals are not within mining claims filed before designation. After wilderness designation, the WSA would be closed to mineral location.

Because production of these minerals is not currently occurring and economic considerations are unfavorable, it is unlikely that exploration or development would occur, even without wilderness designation. Therefore, this alternative would probably not result in any significant loss of recoverable uranium and associated mineral resources.

WILDLIFE

Under this alternative, some wildlife could benefit due to the preservation of solitude and naturalness. Surface disturbance (85 acres) could occur within the 5,580 acres of deer winter range or along 628 acres of riparian habitat. Adverse impacts would be short term while work was ongoing, and habitat could be enhanced over the long term by reclamation and revegetation. The acreage disturbed represents less than 1 percent of riparian habitat and deer winter range in the WSA and is, therefore, not considered significant.

LIVESTOCK

Present domestic livestock grazing would continue as authorized in the Grand Resource Area RMP. The 320 AUMs currently allocated in the WSA are controlled by three livestock permittees. Existing developments (one short fence) could be used and maintained in the same manner as the past, based on practical necessity and reasonableness. New range developments (none are planned) would be allowed only on a case-by-case basis if necessary for resource protection (range and/or wilderness) and the effective management of these resources, provided that wilderness protection standards are met. Development of future roads or other livestock management facilities for use with the 320 AUMs in the WSA could be restricted to preserve wilderness values.

VISUAL RESOURCES

Wilderness designation would contribute to the preservation of the area's visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through VRM Class I management, which generally allows for only natural ecological change and, therefore, reduces the likelihood for visual change or contrast.

Although mitigating measures would be applied to reduce visual contrast created by mineral-re-

lated surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation, some permanent localized degradation could be expected. If roads for development of valid mining claims could not be denied (worst-case analysis), VRM Class I objectives might not be met on portions of the WSA. Because the potential for development of locatable minerals is only moderate, visual quality would probably not be reduced in the WSA as a whole.

CULTURAL RESOURCES

There is a potential for increased vandalism to cultural resources due to increased recreational use of the WSA. Protection afforded by wilderness management, however, would outweigh any potential vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

The entire 9,780-acre WSA would be closed to recreational ORV use. This closure would also apply to the 4 miles of ways within the WSA. As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an undetermined increase in primitive recreational use above the baseline rate. Judging from use densities of a number of well known wilderness areas, proposed wilderness areas, and primitive areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites, it is estimated that, following designation, use could be as much as 2,934 visitor days per year (USDI, BLM, 1985). This is 2,184 visitor days (291 percent) over the area's current estimated 750 annual visitor days. Management provided through a Wilderness Management Plan would attempt to control destructive increases in future recreation use, and the quality of the primitive recreation experience probably would not be negatively affected by the increased use. The 250 visitor days of ORV play activity and/or vehicular hunting and sightseeing in the WSA that could occur without designation would be eliminated from the WSA. Because there are other suitable ORV play areas in the vicinity of the WSA, ORV use would probably not experience an overall decline in the vicinity of the WSA. Commercial outfitting would not benefit.

If roads for development of valid mining claims could not be denied, the quality of primitive recreational opportunities would be reduced. Because the potential for mineral production is only moderate, the quality of the primitive recreational experience would likely be preserved under this alternative.

WILDERNESS VALUES

Wilderness designation would contribute to the preservation of the area's wilderness characteristics. Under this alternative, the potential for surface-disturbing activities that could impair wilderness values would be reduced through management under VRM Class I (which generally allows for only natural ecological change), ORV closure, and closure of the entire area to future mineral leasing and location.

No development of leases is foreseen under this alternative. The possible mineral-related surface disturbance would be 85 acres for development of valid mining claims. Mitigation to protect wilderness values would be considered during mining claim development, but road construction and use of motorized equipment could be allowed if there were no reasonable alternatives. Because the potential for economically feasible mineral development is only moderate, mineral-related disturbance (including access) would eliminate solitude, naturalness, and the opportunity for primitive and unconfined recreation on the affected areas but would not reduce these values in the area as a whole. Because the potential for mineral production is moderate and mitigation would be imposed to protect wilderness values, loss of these values under wilderness designation would be less likely than under the No Action Alternative.

Approximately 9,780 acres of the WSA are considered natural in character and provide over 2,800 acres of outstanding opportunities for solitude and primitive and unconfined recreation. Under this alternative these outstanding opportunities would be preserved. The special features of a perennial stream in Mill Creek Canyon (one of the few side drainages to the Colorado River in Utah) would also be protected.

LAND USE PLANS AND CONTROLS

The *Grand County Master Plan* identifies this area as one of critical and environmental concern needing further studies for wilderness and resource values. Implementation of this alternative would not be inconsistent with the Grand County Plan but might conflict with the policies of the Grand County Commission. The proposed BLM Grand Resource Area RMP does not provide for

wilderness designation. A decision by Congress to designate the WSA as wilderness would be an amendment to the RMP. Plans of other agencies, including the State of Utah, would not be affected.

SOCIOECONOMICS

Overall, there would be no significant changes in current trends of population, employment, and local income distribution.

Because of restrictions placed on the use of resources under wilderness designation, there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 10), as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative.

The potential for mineral development in the WSA is moderate (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Valid existing oil and gas leases and mining claims could be developed but designation would preclude new leases and claims from being established in the WSA. Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they would be with mineral development under the No Action Alternative. Because the potential for mineral development is moderate, mineral-related local income could be reduced by wilderness designation. Any local income related to assessment of future mining claims would be lost.

Livestock use and ranchers' income would continue as at present with $6,400 of livestock sales and $1,600 of ranchers' return to labor and investment. Proposed improvements for livestock would be foregone along with any resulting increase in ranchers' income. No such potential range improvements have been proposed.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section). Related local expenditures would be small (average of $4.10 per visitor day statewide).

Motorized recreational use of the WSA is approximately 250 visitor days per year. The decrease in related local expenditures would be small and insignificant to both the local economy and individual businesses.

The loss of 3,506 acres now leased would cause an eventual loss of up to $10,518 per year of lease fees to the Federal Treasury. There would also be a potential loss of $18,822 annually in Federal revenues from the 6,274 acres that could be leased without designation. In addition to these rental fees, any potential royalties from new lease production, and bonus bid revenues from new leases in known geologic structures could also be foregone.

No existing rights-of-way or permits would be eliminated through wilderness designation; therefore, right-of-way and/or land use permit revenues could be foregone.

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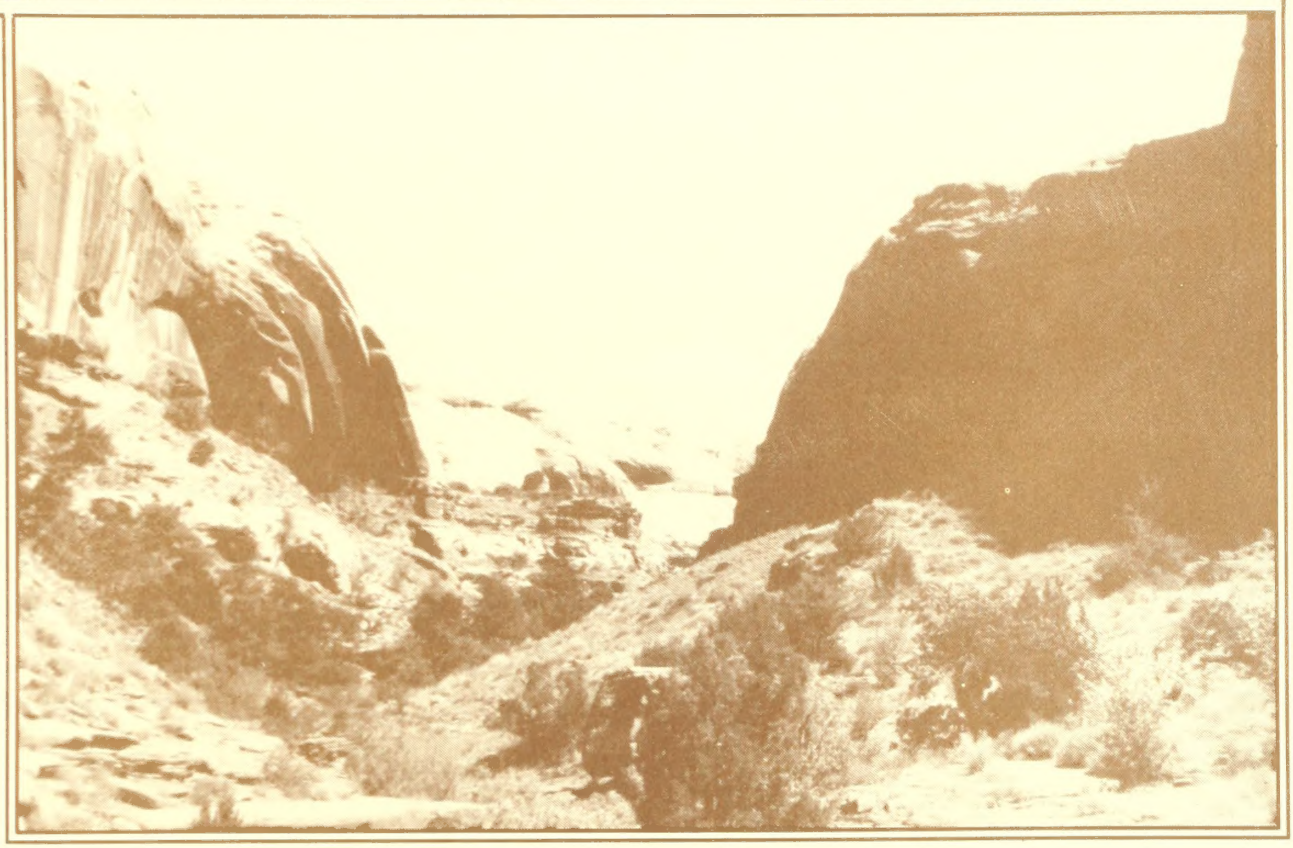
Negro Bill Canyon WSA



NEGRO BILL CANYON WSA
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NEGRO BILL CANYON WSA

(UT-060-138)

INTRODUCTION

General Description of the Area

Negro Bill Canyon lies entirely within Grand County and is immediately northeast of Moab, Utah. The Wilderness Study Area (WSA) extends between Moab and Castle Valley. It is about 8 miles east to west, 0.5 to 2.5 miles north to south, and contains approximately 7,620 acres of BLM-administered land. No State land lies within the WSA; however, several State holdings border the unit on the north and south.

The WSA is bordered on the west by State Highway 128, on the north by State land and a traveled route, on the east by the Porcupine Rim, and on the south by the canyon rim, State land, and traveled routes. The WSA is characterized by Negro Bill Canyon, which cuts into the Navajo Sandstone. A perennial stream with associated riparian vegetation and wildlife occupies the lower portion of the canyon. The balance of the unit is made up of undulating to flat topography covered with a variety of vegetation ranging from pinyon-juniper to low shrubs. The western portion is comprised of a series of sandstone fins.

The WSA has a semiarid climate characterized by very hot summers and moderately cold winters. Annual temperatures range from 120 degrees Farenheit (F) to 10 degrees F. Average annual precipitation ranges from approximately 8 to 10 inches; half of that falls during the growing season. Most precipitation occurs as late summer thunderstorms. Average annual snowfall is between 10 and 20 inches.

Specific Issues Identified in Scoping

General issues pertaining to the WSAs in the Grand Resource Area are discussed in Volume I. Several concerns pertaining to the wilderness study process and/or the environmental analysis process were raised during scoping. These concerns are discussed in the Scoping section of Volume I rather than in individual analyses for WSAs.

Specific issues pertaining to the Negro Bill Canyon WSA identified through the public scoping process (USDI, BLM, 1984) are responded to below:

1. *Comment:* Solitude and recreation opportunities are outstanding. Once one hikes several thousand feet upstream up the mouth, the area is nearly pristine, and a tributary canyon contains the world's fourth largest arch.

Response: As identified in both the Recreation and Wilderness Values sections of the Affected Environment, hiking opportunities within Negro Bill Canyon are outstanding. The Morning Glory Natural Bridge is the fifth widest natural span in the country and is located on State land adjacent the WSA. The Wilderness Values section identifies the WSA as having outstanding opportunities for primitive, unconfined recreation on 2,300 acres and outstanding opportunities for solitude on 1,375 acres.

2. *Comment:* Apparently there were irrational deletions of all or parts of the WSAs and Instant Study Areas (ISAs). After review of Site-Specific Analysis (SSA) summaries in the scoping document, it becomes apparent that many areas have no resource conflicts and excellent wilderness qualities, yet no acres were recommended for wilderness.

Response: During scoping for this Environmental Impact Statement (EIS), BLM presented a preliminary indication of areas considered suitable or unsuitable for wilderness designation. For each WSA, this was based on a site-specific analysis drafted in one of the five Utah BLM districts. The indication of suitability was made public prior to the EIS to obtain further input, which has assisted in the formulation of the EIS alternatives. Additional input is expected as a result of the public review and comment on the Draft EIS. At the conclusion of the EIS process, BLM will review and consider all of the information received and at that time will formulate a final recommendation of areas found suitable for wilderness designation. Rationale for such recommendations will be included in a Wilderness Study Report to be submitted to the Secretary of the Interior and, subsequently, to

Congress. The rationale will be keyed to the criteria of the "Wilderness Study Policy" and to other resource management factors generally as described in Chapter 2, Volume I of this EIS.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated from Detailed Study

During scoping, a Partial Wilderness Alternative was suggested that would eliminate from further study potential energy management conflict areas. However, because the entire WSA has equal potential for oil and gas development, consideration of a Partial Wilderness Alternative would not eliminate potential oil and gas development conflicts. Therefore, a Partial Wilderness Alternative was not considered for this WSA.

Alternatives Analyzed

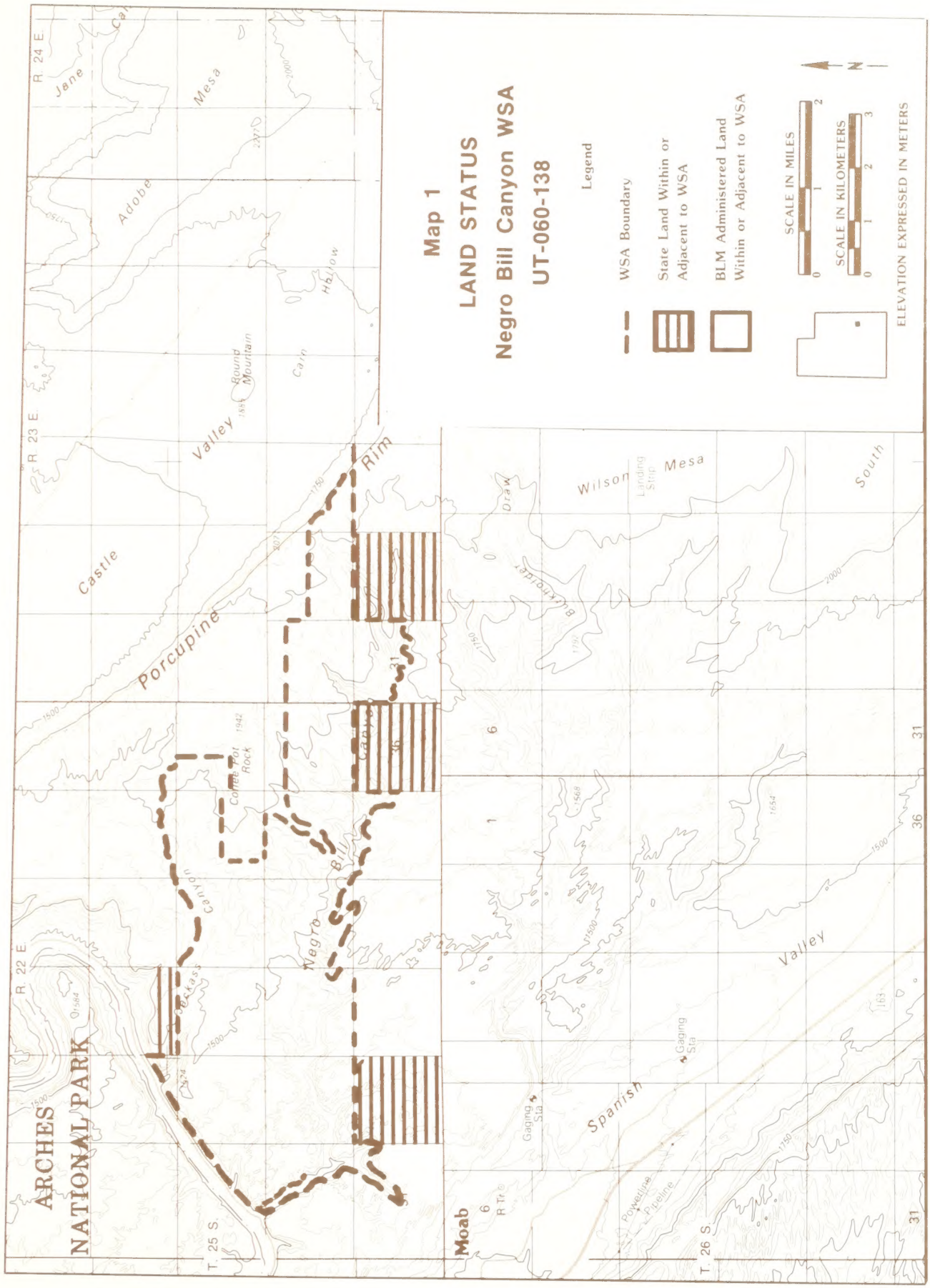
Two alternatives are analyzed for the Negro Bill Canyon WSA: (1) No Action; and (2) All Wilderness (7,620 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE (PROPOSED ACTION)

Under this alternative, none of the 7,620-acre Negro Bill Canyon WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the Grand Resource Area Resource Management Plan (RMP) (USDI, BLM, 1983). No State or private land is located in the WSA (refer to Map 1).

The following are specific actions that would take place under this alternative:

- All 7,620 acres would remain open to mineral location and sale. Development work, extraction, and patenting would be allowed on 185 existing mining claims (3,450 acres) and future mining claims. Development would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases covering 2,260 acres of the WSA could be developed. Future leasing would be allowed under Category 1 (standard stipulations) on 5,765 acres, Category 2 (standard and special stipulations) on 420 acres, and Category 3 (no surface occupancy) on 1,405 acres. No leasing (Category 4) would be allowed on 30 acres.
- The present domestic livestock grazing use in the WSA would continue as authorized in the RMP (200 Animal Unit Months [AUMs]). Use of the existing range developments would continue. These include about .25 mile of fence and a small stock reservoir. New range developments could be implemented without wilderness considerations (none are presently proposed). Livestock grazing would continue to be excluded from the lower 2.5 miles of Negro Bill Canyon to protect riparian habitat.
- Use, maintenance, and development of facilities and improvements for wildlife, water resources, etc. could be allowed if in conformance with the RMP. No facilities are planned in the area.
- Approximately 6,245 acres would be open to off-road vehicle (ORV) use and new access routes for development would be allowed. Some 1,375 acres would be closed to vehicular use as directed by the Grand RMP. Approximately 1 mile of the 1.5 miles of existing road would be closed. The closure would not apply to the 0.5 mile of road at the mouth of Negro Bill Canyon or to other ways and trails in the WSA.
- The entire area would be open to woodland product harvest. There is no harvest of forest products at the present time, nor is any planned.
- The area would continue to be managed under Visual Resource Management (VRM) Class II (4,190 acres) and Class IV (3,430 acres).
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.


Map 1
LAND STATUS
Negro Bill Canyon WSA
UT-060-138
Legend
WSA Boundary
State Land Within or Adjacent to WSA
BLM Administered Land Within or Adjacent to WSA
SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
ARCHES NATIONAL PARK
Moab
R. 22 E.
R. 23 E.
R. 24 E.
T. 25 S.
T. 26 S.
Porcupine Rim
Negro Bill Canyon
Castle Valley
Bound Mountain
Adobe Mesa
Jane Canyon
Corbett Canyon
Courthouse Rock
Wilson Mesa
Landing Strip
Spanish Valley
Gaging Sta
Powerline
Pipeline

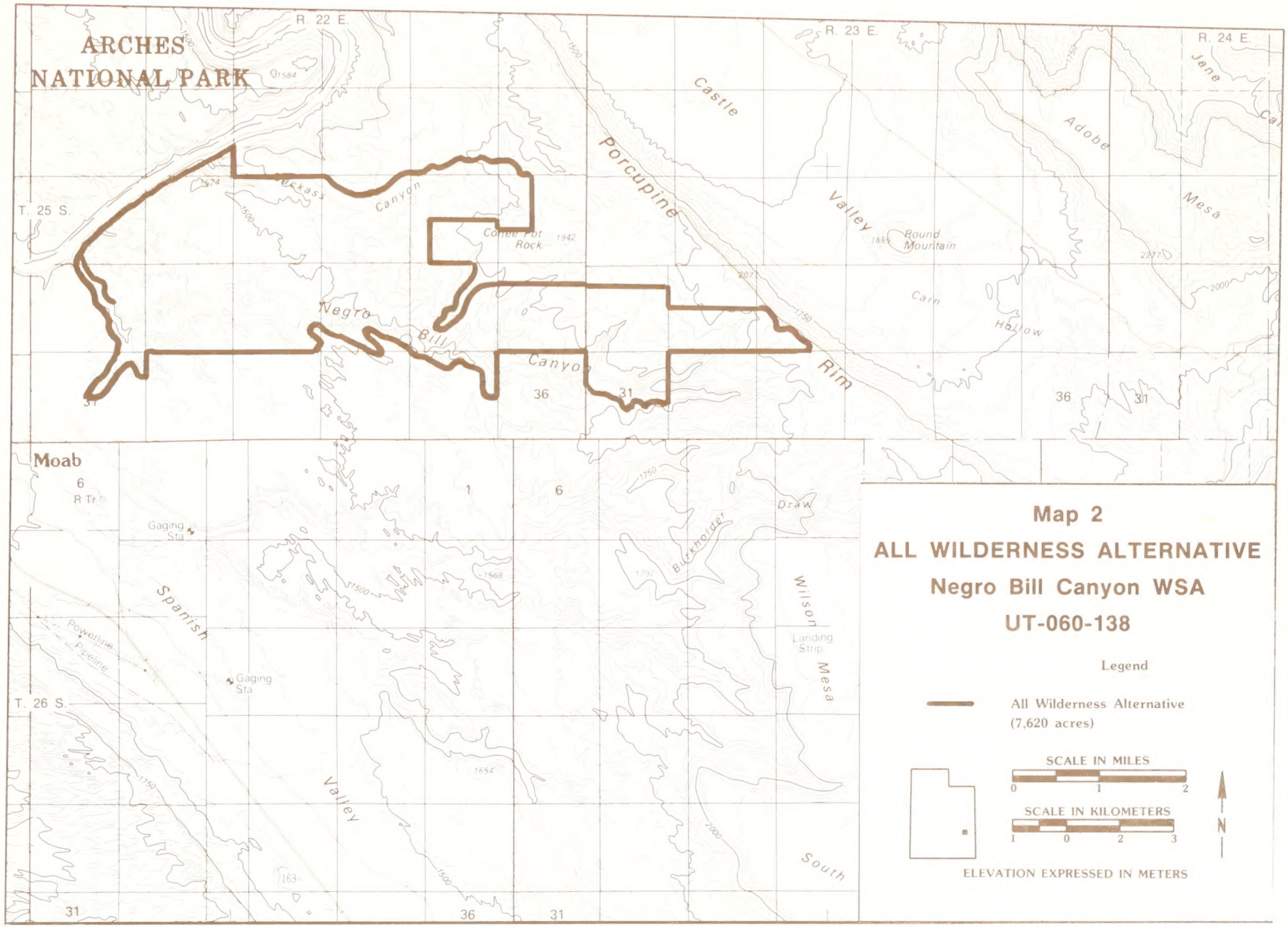
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.
- A variation under the No Action Alternative would be the designation of 1,375 acres of the WSA as an Outstanding Natural Area (ONA). This would include an ORV closure, mineral entry withdrawal, and other management actions similar to those identified for wilderness management. Designation of an ONA would be a separate action subsequent to any Congressional action on the wilderness review and will not be analyzed further in this document.

ALL WILDERNESS ALTERNATIVE

Under the All Wilderness Alternative, all 7,620 acres of the Negro Bill Canyon WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981) to preserve its wilderness character. No State lands are located in the WSA. One of four State sections adjacent to the WSA likely would be exchanged. Should land transfers be made, it is assumed that management and types of impacts to former State inholdings would be the same as those on adjacent Federal lands and no specific analysis is given here. The figures and acreages given under this alternative are for Federal lands only. No private lands or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 7,620 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the approximately 3,450 acres of existing mining claims that may be determined to be valid. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809), with consideration given to wilderness values. Existing oil and gas leases (covering 2,260 acres of the WSA) would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.
- Present domestic livestock grazing would continue as authorized in the Grand Resource Area RMP. The 200 AUMs in the WSA would remain available to livestock as presently allotted. The lower 2.5 miles of Negro Bill Canyon would continue to be excluded from livestock grazing. Use and maintenance of rangeland developments existing at the time of designation (less than 1 mile of fence and one small stock reservoir) could continue in the same manner as in the past based on practical necessity and reasonableness. After designation new rangeland developments would be allowed on a case-by-case basis if necessary for rangeland and/or wilderness resource protection and management.
- New water resource facilities or watershed activities not related to range or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are located in the Negro Bill Canyon WSA, and none are currently planned.
- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values. None are existing or planned in this WSA.
- The entire 7,620-acre area would be closed to ORV use except for (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. Approximately 1 mile of the 1.5 miles of existing road would be closed. About 0.5 mile of the road at the mouth of Negro Bill Canyon is "cherry-stemmed" and would remain open to vehicular access. Vehicular ways would not be available for vehicle use except as indicated above.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 7,620-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to or "cherry-stemmed" into the wilderness area for pur-


ARCHES
NATIONAL PARK
R. 22 E.
R. 23 E.
R. 24 E.
T. 25 S.
T. 26 S.
Moab
Castle
Porcupine
Rim
Valley
Adobe
Mesa
Jane
Negro
Bill
Canyon
Beckass
Canyon
Coffee Pot
Rock
Round
Mountain
Corn
Hollow
Spanish
Valley
Powerline
Pipeline
Gaging
Sta
Gaging
Sta
Buckhorn
Draw
Wilson
Mesa
Landing
Strip
South
36
31
1
6
Map 2
ALL WILDERNESS ALTERNATIVE
Negro Bill Canyon WSA
UT-060-138
Legend
All Wilderness Alternative
(7,620 acres)
SCALE IN MILES
0 1 2
SCALE IN KILOMETERS
1 0 2 3
N
ELEVATION EXPRESSED IN METERS

poses of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.

- Harvest of forest products would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products at the present time, nor is any specifically planned.
- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial methods.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Unless otherwise indicated, information for this section was taken from the Grand RMP and other BLM technical reports and documents.

Air Quality

The WSA has a Prevention of Significant Deterioration (PSD) Class II air quality classification as per the 1977 Clean Air Act Amendments. Arches and Canyonlands National Parks are the only nearby Class I areas. Arches National Park is less than 1 mile away. Prevailing winds are from the west-southwest. The air quality generally meets Class II standards.

Visibility, both within and from the WSA, is an important value. Portions of the WSA can be seen from many high-use areas including the LaSal Mountains, the Colorado River, and Arches National Park. Visual range in this portion of Utah averages between 100 and 132 miles during the summer (Aerocomp, Inc., 1984).

Geology

Negro Bill Canyon is a side canyon generally trending west to east from the main Colorado River Canyon in south-central Grand County, Utah. It is located in the Canyonlands Section of the Colorado Plateau Physiographic Province. A perennial stream is present in the canyon. This stream, a tributary of the Colorado, formed the canyon by erosive action. Also in the WSA, essentially paralleling Negro Bill Canyon, is a similar feature called Jackass Canyon. The stream in Jackass Canyon is intermittent. The WSA is bordered by the eastern portion of the Colorado River Canyon.

Topographically, the highest point in the WSA is 4,769 feet above sea level on the flat above the

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
NEGRO BILL CANYON WSA

Resource	Alternatives	
	No Action (Proposed Action)	All Wilderness (7,260 Acres)
Soils and Water Resources	Assuming a worst-case analysis, disturbance by mineral-related activities on 815 acres could increase soil loss in the WSA by up to 8.6 percent per year and reduce the quality of ground and surface water.	There would be no significant effects under this alternative.
Mineral and Energy Resources	Potential recovery could be achieved for up to 3 to 15 million barrels of oil, 18 to 90 billion cubic feet of natural gas, 75,000 to 7.5 million tons of potash, 500 to 1,000 tons of uranium oxide, 50,000 tons of copper, and 100,000 tons of manganese. There is a moderate probability of development of some minerals in the WSA.	Oil, gas, and potash likely would not be recovered. Assuming a worst-case analysis, the recovery of locatable minerals would also be foregone. There could be a loss of development opportunity for oil and gas and uranium.
Wildlife	About 10.7 percent of the WSA could be affected by mineral and energy development, which could affect wildlife habitat.	Wildlife would benefit from solitude.
Livestock	Grazing of 200 AUMs and maintenance of existing developments would continue. New developments could be implemented; however, none are now proposed.	Grazing of 200 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. New developments proposed in the future might not be allowed.
Visual Resources	The quality of visual resources could be impaired on up to 815 acres, which could reduce visual quality throughout the WSA.	Visual quality could be impaired on up to 85 acres.
Recreation	ORV use would continue on 0.5 mile of way. Overall recreational use, including primitive and motorized activities, could increase from the present 2,600 visitor days per year to 3,870 over the next 20 years. Up to 815 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including 1 mile of way, would be closed to ORV use. Primitive recreational use could increase to as much as 3,810 visitor days per year due to publicity associated with wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 815 acres (10.7 percent of the WSA). This could reduce wilderness values throughout the WSA.	Wilderness values would be protected, except on up to 85 acres (1.2 percent of the WSA) which may be disturbed by development of valid mineral rights.
Land Use Plans and Controls	This alternative would be consistent with the *Grand County Master Plan,* and State of Utah plans and policies. It would be in conformance with the BLM Grand RMP.	This alternative would not be inconsistent with the *Grand County Master Plan* but would conflict with the policies of the Grand County Commission. It would not conflict with State policy. Designation would constitute amendment of the BLM Grand RMP.
Socio-economics	Annual local sales of less than $37,750 and Federal revenues of up to $7,160 would continue. An additional $15,990 per year in Federal revenues could be derived from leasing of presently unleased areas.	Annual local sales of less than $37,750 and Federal revenues of up to $280 would continue, but Federal revenues of up to $22,770 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.

canyons. The lowest point, where the perennial stream in Negro Bill Canyon nears the Colorado River, is about 3,995 feet above sea level.

Structurally, the WSA is situated on the gentle eastern flank of the northwest-southeast trending Courthouse Syncline. The strata dips to the east at angles of 1 to 5 degrees. One fault of some significance is present in the north-central part of the WSA. This vertical fault strikes northwest and dips to the northeast. Displacement, however, is less than 100 feet. The fault dies out less than 0.25 mile into the WSA from the northern boundary.

Stratigraphically, the most striking formation exposed at the surface is the Jurassic Triassic-aged Navajo Sandstone. The Navajo Formation, a red-to-white ancient sand dune stratum, is markedly crossbedded and is approximately 300 feet thick in the WSA. It comprises the bulk of the spectacular canyon walls of both Negro Bill and Jackass Canyons at their confluence with the Colorado River Canyon. The Navajo Sandstone frequently erodes into massive fins and arches. An example of these fins is located near the western edge of the WSA.

Below the Navajo is the Triassic Kayenta Formation. Usually redder than the Navajo, the Kayenta is thinly bedded through its 200-foot thickness in the WSA. It forms a portion of the canyon walls in both upper Jackass and Negro Bill Canyons. Below the Kayenta is the extremely massive Wingate Sandstone, which is up to 300 feet thick in the area. Although most of it is below the surface in the WSA, it also forms some of the spectacular canyon walls in the west and east ends of the WSA. Two other formations are exposed, but only in a very small area along the Colorado River Canyon in the extreme northwest portion of the WSA. The higher of the two is the Triassic Chinle Formation, which is approximately 300 feet thick. The oldest exposed formation is the Moenkopi, which is about 200 feet thick.

At depth, the WSA is underlain by pre-Cambrian basement rock, found at about 16,000 feet. Above this is a Cambrian layer with a Devonian limestone sequence resting unconformably above. Mississippian-aged formations are represented by the Leadville Limestone. Above this lies the Pennsylvanian Hermosa Group. Lower limestone formations are followed by the Paradox Formation interbedded salts. The total thickness of the Paradox salts under the WSA is at least 4,000 feet. This is overlain by the Honaker Trail and Elephant Canyon fossiliferous limestones, about 1,000 feet thick here. Above the Hermosa Group is the Permian-aged Cutler, about 400 feet thick. Above this lies the Moenkopi, which is exposed in places in the WSA.

Soils

Negro Bill Canyon is characterized by steep-walled canyons. About 40 percent of the area is composed of shallow or deep sandy soils on sloping cuestas or structural benches intermixed with rock outcrop. About 20 percent is deep loamy soils on alluvial fans and floodplains along the floors of the canyon. About 40 percent is rock outcrop occurring as slickrock on the cuestas and steep canyon walls. The sandy soils on the cuestas are highly susceptible to wind erosion when disturbed.

Table 2 describes soil characteristics and land types and Table 3 describes erosion condition for the WSA.

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year)	
			Present Condition	Bare Soil Surface
Rock Outcrop	40	3,048	0.0	0
Shallow to deep sandy soils on sloping structural benches on cuestas	40	3,048	1.0	5
Very deep loamy soils on gently sloping alluvial fans and floodplains	20	1,524	0.1	1
Totals	100	7,620		

Source: Hansen, 1985.

Vegetation

Vegetation in the WSA is dominated by blackbrush and juniper. Other associated species are pinyon pine, snakeweed, and rabbitbrush, with grasses being Indian ricegrass, galleta, and cheatgrass. Barren areas composed largely of slickrock and other rock outcrop take up about 30 percent of the area. Vegetation in the riparian area of Negro Bill Canyon includes Gambel's oak, willow, tamarisk, sagebrush, cottonwood, skunkbush, and reed canary grass.

Limited inventories for threatened, endangered,

Table 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions			Annual Soil Loss if Disturbed		
		Percent of Area	Acres	Cubic Yards	Percent of Area	Acres	Cubic Yards
Very High	20.0	0	0	0	0	0	0
High	10.0	0	0	0	0	0	0
Medium	5.0	0	0	0	40	3,048	15,240
Low	1.0	40	3,048	3,048	20	1,524	1,524
Very Low	0.1	20	1,524	152	0	0	0
None	0.0	40	3,048	0	40	3,048	0
Totals		100	7,620	[1]3,200	100	7,620	[1]16,764[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.42 under present conditions; 2.2 if disturbed.

and sensitive plants have been conducted in the Grand Resource Area. There are no known threatened, endangered, or sensitive plant species within the WSA. Inventories have noted the importance of hanging gardens as possible habitat for several rare plant species. The rare plant *Aquilegia micrantha* is found in some of the hanging gardens in Negro Bill Canyon; however, this species is not considered sensitive, threatened, or endangered.

Table 4 shows the existing vegetation types within the WSA.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Blackbrush	1,372	16
Blackbrush-juniper	3,353	44
Riparian	610	8
Barren	2,285	30
Total	7,620	100

Source: USDI, BLM, 1972.

The Negro Bill Canyon WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) type of the WSA is juniper-pinyon woodland. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

Water Resources

There are approximately 10 miles of streams within the WSA. Of these, approximately 6 miles of stream in Negro Bill Canyon are perennial and approximately 4 miles of stream in Jackass Canyon are intermittent. Negro Bill is a spring-fed water source that drains into the Colorado River. The stream channel is stable, and there is little evidence of channel deterioration. This is due in part to the series of beaver dams in the lower portion of the drainage. The dams also aid in the reduction of sediment load by increasing the pooling and ponding of water. Erosion of the streambank is virtually absent due to the dense growth of riparian vegetation on the upper and lower banks. The main streambank erosion problem is associated with the road up Negro Bill Canyon. There are numerous places where the road crosses the channel or actually is located in the streambed.

The lower 2 miles of Negro Bill Canyon, plus lands within the WSA bordering the Colorado River, are currently under a powersite reserve.

These withdrawals date to 1909. There are no active proposals to develop a hydroelectric facility in this area, and the likelihood of future projects is doubtful.

Seven unnamed springs have been inventoried in the WSA, but only four had flows sufficient for water quality testing. The data in Table 5 were obtained from these four springs in September 1981.

Between 1978 and 1979, the data in Table 6 were obtained from nine samples taken at the mouth of Negro Bill Creek.

There are no water wells in the WSA and, therefore, no ground water quality data; however, the geologic formations in Negro Bill Canyon WSA have been found elsewhere to yield fresh water to wells. Therefore, ground water quality should be acceptable for recreation, wildlife, livestock, and agricultural uses.

TABLE 5
Water Quality of Sampled Springs

Water Quality Parameter	Range	Mean
Specific conductance	200 to 425 mmhos/cm[1]	331 mmhos/cm
pH	8.1 to 8.9	8.5
Water Temperature	22 to 26 degrees C[2]	19 degrees C

Source: USDI, BLM, 1983.

[1]millimhos per cubic meter.
[2]Centigrade.

TABLE 6
Water Quality of Negro Bill Creek

Water Quality Parameter	Mean
Stream flow	3.5 cfs[1]
Specific conductance	349 mmhos/cm
Sodium	8.33 mg/l[2]
pH	7.95
Water Temperature	11.4 degrees C

Source: USDI, BLM, 1983.

[1]cubic feet per second.
[2]milligrams per liter.

Mineral and Energy Resources

Mineral resources are not known to have been recovered from the WSA, although the WSA is underlain by strata known to be favorable for oil and gas, uranium, and potash deposits. The region of the WSA, the Paradox fold and fault belt, is a significant producer of these mineral resources. The WSA has been worked in the past for copper.

Each WSA was assessed for its mineral and energy resources by Science Applications, Inc. (SAI, 1982). The results are summarized in Table 7. (Refer to Appendix 5 for an explanation of the SAI rating system.)

TABLE 7
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f3	c2	10 to 50 million barrels of oil; 60 to 300 billion cubic feet of natural gas
Uranium/ Vanadium	f3	c2	500 to 1,000 tons
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f1	c4	None
Copper	f2	c1	Less than 50,000 tons
Potash	f3	c3	1 to 10 million tons
Manganese	f2	c1	Less than 100,000 tons

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

An overall importance rating (OIR) of 3 was assigned to the Negro Bill Canyon WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly

and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. The WSA could contain deposits of vanadium, manganese, and copper that are currently listed as strategic and critical materials (Federal Emergency Management Agency, 1983). Although listed as strategic, copper is relatively common. Supplies currently exceed domestic demand.

LEASABLE MINERALS

There are no mineral leases within or adjacent to the WSA, other than for oil and gas. Other leasable minerals produced regionally include potash and coal. Coal is produced regionally; however, Cretaceous coal-bearing strata either never were deposited in the vinciity of the WSA or have eroded away.

Oil and Gas

The tract evaluated by SAI contains 9,420 acres and includes Drinks Canyon and a portion of Hal Canyon. The WSA accounts for 81 percent of this tract. The SAI rating (f3) indicates that potential exists within the tract for 10 to 50 million barrels of oil and 60 to 300 billion cubic feet of gas. Approximately 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas are considered recoverable (Appendix 6 provides recoverability estimates). The certainty level (c2) indicates that some positive data exist within the vicinity of the tract or on trend with the tract.

SAI has estimated that the Paradox Basin in southeastern Utah and western Colorado contains 1.2 billion barrels of undiscovered recoverable oil and 3.8 trillion cubic feet of undiscovered recoverable gas. Most production occurs from Pennsylvanian-aged rocks, produced from the Paradox Formation in Long Canyon, Shafer Canyon, Kane Creek, and Bartlett Flat, all about 6 to 13 miles west and southwest of the WSA, and from Wilson Canyon about 18 miles south. However, favorability of occurrence in the Paradox Formation within the WSA is seen as moderate, while the favorability for occurrence in Mississippian Formations is seen as fairly high. The petroleum potential within the WSA is related more to Mississippian than to Pennsylvanian reservoir rocks, because the Paradox Formation (Pennsylvanian) presents thin, discontinuous, interbedded plastic reservoirs, and the Mississippian contains favorable source and reservoir rocks with potentially favorable pre-Pennsylvanian structural features. The Lisbon Valley Field about 28 miles southeast of the WSA, is produced from a Mississippian Formation. Continuing interest in the area, however, is evidenced by recent (1981-82) seismic work in the WSA.

The majority of the WSA (99 percent) is open to oil and gas leasing under the BLM category system established in 1975 (USDI, BLM, 1975). Categories include: Category 1 (standard stipulations) on 5,765 acres; Category 3 (no surface occupancy) on 1,405 acres, covering the lower two-thirds of Negro Bill Canyon; Category 2 requiring special stipulations (no development within 0.24 mile from the Colorado River, to protect scenic and recreational values as well as the river's floodplain on an area along the Colorado River (420 acres). A no lease area (Category 4) lies along the southern boundary and covers less than 1 percent (30 acres) of the WSA. Table 8 identifies the oil and gas categories for the WSA.

TABLE 8
Oil and Gas Leasing Categories

Category	Acres of WSA	Percent of WSA
1. Open with standard stipulations	5,765	75
2. Open with special stipulations	420	6
3. Open with no surface occupancy	1,405	18
4. Suspended or no lease	30	1
Total	7,620	100

Source: USDI, BLM, 1975.

The WSA contains all or portions of 11 leases (three pre-FLPMA and eight post-FLPMA) covering 2,260 acres of the WSA. There are 760 acres (1 percent of the WSA) of pre-FLPMA leases and 1,500 acres (19 percent of the WSA) of post-FLPMA leases.

Pre-FLPMA leases are due to expire in 1985 unless they go into production. Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require re-

stricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

Potash

Bedded potash is found within the Paradox Formation underlying the Paradox Basin. Sylvite, a potash-bearing mineral, is mined by a solution process about 10 miles southwest of the WSA and is economically important to the Moab community. The potash-bearing zones under the WSA are estimated to be well below 7,000 feet. Currently the potash market is depressed due to cheap foreign supplies. It is unlikely that new potash development would occur under present market conditions.

The SAI rating for potash (f3) indicates a potential for 1 to 10 million tons of potash within the tract evaluated; the WSA represents 81 percent of this tract. Approximately 75,000 to 7.5 million tons of potash are considered recoverable. The certainty level (c3) indicates data showing a potash-bearing formation underlying the WSA and an active potash mine nearby.

LOCATABLE MINERALS

The Colorado Plateau contains 50 percent of the Nation's total uranium reserves and about 36 percent of potential resources (SAI, 1982). The Colorado Plateau around Moab is very important for uranium and vanadium. Principal uranium-bearing units locally are the Jurassic Morrison Formation, the Triassic Chinle Formation, and the Permian Cutler Formation. The Morrison Formation has been removed by erosion from the WSA. The Chinle is favorable over broad areas of the Colorado Plateau, and the WSA is in the vicinity of an ancient channel system known to contain uranium-bearing sediments (the Moss Back Member of the Chinle). The structural and stratigraphic setting is similar to Lisbon Valley (as mentioned above); the Big Indian belt of the Lisbon Valley is one of the two most important uranium-production areas in the Nation. The host rock in the Big Indian belt is the base of the Chinle and the upper part of the underlying Cutler Formation along the southwest flank of the anticline. Uranium deposits can be highly localized, and the WSA may have some potential for development. The SAI rating for uranium indicates a moderate potential for 500 to 1,000 tons of uranium oxide in-place within the WSA.

Other minerals produced regionally include copper, manganese, gold, and silver. The WSA is considered geologically unfavorable for these, although it does contain an old copper prospect. Localized copper deposits have been mined from the Kayenta but do not appear to be present within the WSA. Localized manganese deposits have been found randomly in Jurassic Morrison and Summerville Formations (not present within the WSA), and in the Chinle (again, none are known in the WSA). Gold and silver are commonly found in placer deposits along streams, but drainage patterns within the WSA are highly unfavorable for this type of deposition.

Exploratory drilling has occurred within the WSA over the past 20 years, but no attempts at production have been made.

There are all or portions of 185 mining claims within the WSA apparently located for uranium. They cover approximately 3,450 acres, totaling about 45 percent of the WSA. All the claims are concentrated in the western half of the WSA and appear to be current in annual assessment work.

Wildlife

The area provides habitat for a variety of wildlife species. Mule deer, coyotes, bobcats, cottontail rabbits, beaver, chukar partridge, and a variety of reptiles and rodents may be found throughout the WSA. Several species of raptors and songbirds also inhabit the area. Cougar and black bear may rarely visit the area.

Due to the lack of precipitation, the nature of the soils, redrock cliffs, and extremely hot summer temperatures, this area is not capable of supporting a diversity of vegetation sufficient to produce large populations of big game animals. The most common big game present are mule deer, which are found in relatively small numbers. The WSA is located in the Utah Division of Wildlife Resources (UDWR) Deer Management Herd No. 30A. Crucial riparian habitat (610 acres) for mule deer is located in canyon bottoms. Also, 3,353 acres of deer winter range have been identified by BLM in the WSA.

Chukar partridge and ringnecked pheasant are occasionally sighted in the canyon near the perennial stream. Chukar and pheasant are exotic

species introduced in the area in the early 1960s. Mourning dove are common in the canyon during the early spring to early fall period. Desert cottontail rabbit are common unit wide.

Waterfowl occasionally occupy the area of the perennial stream in Negro Bill Canyon. The most common species are mallard, blue-winged teal, and common mergansers.

Several fish species can be found in the perennial stream in Negro Bill Canyon. The most common are bluehead sucker, roundtail chub, red shiner, fathead minnow and plains killifish. Game fish include large-mouth bass and green sunfish, although the small size of the stream precludes quality fishing.

The stream channel can be characterized as well developed and stable. Riparian vegetation is dense and diverse in species composition. Gravel bars and rocky substrate in the stream provide spawning habitat for fish. The stream does not have a developed sport fishery. Several beaver ponds are scattered along the perennial stream, and beaver activity has increased over the last few years.

Invertebrate production in the stream is very high, except in a few large ponds that have silted in. Studies indicate that invertebrate species in the stream are tolerant of sedimentation and some organic enrichment. Crayfish are abundant.

The most common reptiles and amphibians include striped whipsnake, gopher snake, midget faded rattlesnake, sideblotched lizard, and red-spotted toad.

The most common birds in the WSA are canyon wrens, rock wrens, belted kingfishers, kestrels, ravens, redtailed hawks, and golden eagles. The golden eagle is a BLM sensitive species. Raptor nests are located on sandstone ledges in the canyon.

A survey of threatened and endangered wildlife indicated that available habitat for bald eagles, American peregrine falcons, and spotted owls exists in Negro Bill Canyon. Sightings of these species have not been reported in the WSA. Although potential habitat would extend throughout the entire WSA, there are no acres classified as critical.

There are no existing or potential vegetation treatments for improvement of wildlife habitat. No wildlife transplants are proposed.

Forest Resources

No forest products have been produced from the WSA. The potential exists for a harvest of 391 cords of firewood within the 3,353 acres containing juniper.

Livestock and Wild Horses/Burros

The WSA lies within the North Sand Flats grazing allotment (20,534 acres and 798 AUMs). One operator is licensed on this allotment from October 1 to April 15 during most years. The WSA covers approximately 37 percent of the allotment, and only about 25 percent (200) of the AUMs. The cattle do not make extensive use of the WSA because of inaccessibility, lack of water, and poor quality forage. An average of about 60 AUMs are used. The lower 2.5 miles of Negro Bill Canyon are excluded from grazing except for trailing of stock during the early winter and spring. Negro Bill Canyon is one of the few access routes to the upper part of the allotment.

There are two range improvement projects of record in the WSA: a .25-mile-long fence, which is 2.5 miles from the mouth of Negro Bill Canyon, and a small stock reservoir. There are no opportunities for land treatment. No rangeland improvements are currently proposed.

Wild horses or burros are not known to occupy the WSA.

Visual Resources

The WSA was included in a visual study completed in 1980. The WSA contains 4,190 acres of Class A and 3,430 acres of Class C scenery. Both VRM Class II (4,190 acres) and IV (3,430 acres) areas were assigned to the WSA. Refer to Appendix 7 for a description of BLM's VRM rating system.

The major landscape feature in the WSA is Negro Bill Canyon, with sheer canyon walls mixed with rock outcrops. Colors are deep rust-red sandstones to maroon reds, deep tans to light tans and grays, and gray-green outcrops.

Vegetation is a combination of riparian plant communities (i.e., tamarisk and willow) and upland trees (i.e., pinyon and juniper). Colors are dark green to light green and gray-greens.

Several types of modifications exist within the WSA boundaries, with each exerting varying degrees of visual contrast. These include one small stock pond, several seismograph lines and star patterns, a jeep trail, and a .25-mile-long fence.

Cultural Resources

Known historic and prehistoric remains contribute to scientific and recreation values of Negro Bill Canyon. Although no complete inventory exists, at least two historic and one prehistoric sites are reported. Known sites include a historic cowboy cave, a 1950s copper prospect and camp, and a prehistoric petroglyph panel of uncertain date. All are within Negro Bill Canyon. Numerous additional sites were found in nearby portions of Arches National Park. No sites listed in or nominated to the National Register of Historic Places are within the WSA, although known sites may have that potential. It is estimated that the WSA may have as many as 12 cultural sites, six of which could be National Register eligible.

Cultures represented in the region include the Paleo Indian, Desert Archaic, Fremont, Anasazi, Ute, and historic European.

European influence in the region dates from the Dominguez-Escalante Expedition of 1776, followed by Mexican traders of the Old Spanish Trail and French fur trappers in the 1810 to 1840 era. American explorers crossed the region just north and west of the WSA in the 1850s about the time the first Anglo-American settlement was also attempted at Moab. Permanent American settlement occurred in the late 1870s and early 1880s with ranching spreading to the WSA at that time. Use of the WSA was made mostly from ranches in the Moab area. According to at least one account the canyon was named after William Granstaff, a mulatto, who allegedly ran cattle there in the early 1880s.

Recreation

There are no documented use statistics for Negro Bill Canyon; however, the area is considered a popular local recreation spot, as well as a retreat for visitors. The area comprises a variety of landforms. Negro Bill Canyon itself is the principal scenic attraction. Here a colorful sandstone canyon with a perennial stream provides hiking, backpacking, and backcountry camping opportunities. Present annual use levels are on the increase with hiking accounting for about 2,000 visitor days, horseback use 100 visitor days, and ORV use 500 visitor days.

School groups frequently hike the canyon in connection with environmental studies. The Navajo Sandstone provides spectacular cliffs, giant alcoves, domes, and fins. The canyon bottom with its perennial stream supports riparian vegetation. Beaver ponds support a variety of aquatic life and provide visitors the opportunity to cool off. Sightseeing and photography are popular pastimes in the canyon. A commercial horseback operation transports visitors through the scenic canyon to Morning Glory Natural Bridge on State land, adjacent to the WSA. The 100 visitor days described previously for horseback use are attributed to this commercial outfitting operation. Morning Glory Natural Bridge is the fifth widest natural span in the country and a frequent destination of hikers. A cattle trail also used by recreationists traverses part of the length of Negro Bill Canyon terminating at nearby Sand Flats Road.

A mining road, which was extended 1.5 miles into Negro Bill Canyon in 1979, provides recreational four-wheel drive vehicle access into the lower canyon. Beaver activity has closed the last 0.5 to 0.75 mile of the route.

Above the canyon rim other recreational opportunities exist. Vehicle routes provide access along the perimeter of the WSA, and seismograph lines within the unit provide recreational vehicle opportunities. The Porcupine Rim four-wheel drive route skirts the WSA and is used during the annual Moab Jeep Safari event. During the 1982 Jeep Safari, 44 vehicles registered for this trail. While opportunities for nonmotorized forms of recreation such as hiking, hunting, etc., do exist above the rims of Negro Bill Canyon within the WSA, actual nonmotorized use is considered minimal.

Under the Grand RMP, the 1,375-acre portion of the WSA recommended for designation as an ONA would be closed to ORV use under 43 CFR provisions. Approximately 1 mile of the 1.5 miles of existing road would be closed. The closure would not apply to the 0.5-mile portion of the road at the mouth of Negro Bill Canyon which is "cherry-stemmed" or to other ways and trails within the WSA.

Wilderness Values

SIZE

At 7,620 acres, the WSA is of sufficient size to meet wilderness standards. The WSA is approximately 8 miles east to west and 0.5 to 2.5 miles north to south.

NATURALNESS

The WSA is generally natural in character with several exceptions. A seismograph line extends 3 miles into the northern third of the unit. The line was constructed in 1962 and has been reclaimed

in part but remains substantially noticeable at some locations. Where the line crosses washes, new routes to avoid the washes have been developed and show continual use by vehicles. A cross line extends both north and south from the main line in Section 21, Township 25 South, Range 22 East. The southern line extends for 1.25 miles and ends in a star pattern.

The northern portion of this line extends from the northeast through Jackass Canyon and joins the vehicle route forming a portion of the northern border (which is part of the Porcupine Rim Trail). Several additional seismograph trails are evident in this area, as well as in the northern and eastern portions of the WSA. A small pre-FLPMA livestock reservoir is located in the southeast corner of Section 13. Approximately 100 acres are impacted by ORV use. A post-FLPMA fence is found 2.5 miles from the mouth of Negro Bill Canyon in Main Canyon. It is about 0.25 mile long and is constructed with green metal posts and four-strand barbed wire. A set of wood steps was constructed at the fence. Most of the imprints are substantially noticeable from viewpoints such as fins and to a lesser degree from ridgetop vantage points. From lower observation points these imprints are less noticeable and, in places, are hard to distinguish.

A mining road that was upgraded (unauthorized) after the passage of FLPMA extends up the bottom of Negro Bill Canyon approximately 1.5 miles. Approximately .5 mile of this road at the mouth of the canyon was in existence prior to FLPMA and is "cherry-stemmed." At the present time the road is substantially noticeable due to continued use by motor vehicles, but has reclamation potential if closed. A pre-FLPMA cattle trail extends south from the canyon bottom in Township 25 South, Range 22 East, Section 28, to the flats above.

In total, approximately 600 acres do not meet the naturalness criterion, with the remaining 7,020 acres being natural and meeting the criterion.

SOLITUDE

The WSA offers outstanding opportunities for solitude within portions of the unit due to the variety of topography present.

The size of the WSA is not a contributing factor to the wilderness values present. The area does not give the visitor a feeling of vastness. The configuration of the WSA is of considerable importance in the ability to assure protection of the wilderness values. The eastern and northeastern portions of the WSA are approximately 0.5 mile wide in places. One finger in the southwest portion of the WSA is less than 0.25 mile wide.

Sheer canyon walls provide vertical separation and screening. The depth and winding nature of the canyon enhances topographic screening. In the eastern half of the canyon, the cliff walls become less sheer, with several side canyons branching off the main drainage. Vertical separation is not so pronounced. The winding nature of the eastern half of the canyon also provides some screening. The side canyons that branch off the main drainage provide additional topographic screening. Topographic screening is also provided by sandstone fins in the western part of the unit near the canyon mouth.

The upper elevations of the unit consist primarily of windblown sand and sandstone formations. Some topographic screening is also provided by this uneven terrain, but it is less than outstanding. Narrowness of the canyon can detract from the solitude when many people are in the area by limiting their opportunity to avoid each other.

Significant vegetation screening is provided by riparian vegetation along the creek in Negro Bill Canyon and from moderately dense juniper and pinyon growth in the eastern portion of the WSA. Vegetation screening does diminish in the canyon bottom in the upper portion of Negro Bill Canyon and is absent in slickrock and low brush and grass-covered areas.

Solitude is limited in the central portion of the unit outside the canyon environment due to lack of vegetation screening, but increases in the northern and eastern portions of the WSA.

Sights and sounds of human activity outside the WSA are present from some locations within the WSA. The western edge of the unit is bordered by State Highway 128, which is the major route between Moab and the community of Castle Valley. Also, portions of the Sand Flats Road are visible from the eastern portion of the unit. The Slickrock Bike Trail lies adjacent to the WSA on the south. The activities of people outside the WSA, primarily vehicle use with its associated noise, could adversely affect the opportunity for solitude in selected areas throughout the WSA.

A visitor could easily find a secluded spot in the eastern portion of Negro Bill Canyon or in the fin portion near the western boundary. Opportunities are somewhat diminished in the lower portion of the canyon due to the WSA's narrowness. It would be difficult to find seclusion in the central portion of the unit due to lack of vegetation and topographic screening.

In summary, the Negro Bill Canyon portion of the WSA (1,375 acres or 18 percent of the WSA) meets the outstanding criterion for solitude. The

balance of the WSA (6,245 acres) does not meet the outstanding solitude criterion for areas under wilderness review.

PRIMITIVE AND UNCONFINED RECREATION

Portions of the canyon provide outstanding opportunities for hiking, camping, backpacking, and nature study. Sandstone fins near the mouth of the canyon also provide outstanding recreational hiking opportunities. The colorful sandstone formations, particularly in and near Negro Bill Canyon, offer excellent photographic opportunities. Horseback riding is gaining popularity in the WSA.

In summary, primitive and unconfined recreation opportunities meet the outstanding criterion on 2,300 acres of the WSA (the canyon and fins areas), and do not meet the standard on the remaining 5,320 acres.

SPECIAL FEATURES

Negro Bill Canyon is one of the few side drainages to the Colorado River in Utah that contains a perennial stream. This is of particular significance when considering its proximity to the community of Moab, making it easily available for public use.

Land Use Plans and Controls

There are no State or private in-holdings within the WSA. Four State sections border the unit on the north and south. The State Land Board manages the State sections for economic return to the State School System.

The WSA is managed by BLM under the Grand RMP. The RMP has been reviewed by the Governor of the State of Utah and is consistent with State plans and policies. The RMP does not address potential wilderness designation for the WSA. As identified in the RMP, the area would be studied further as an ONA. Uses permitted in the RMP are identified under the No Action Alternative.

Powersite withdrawals along the Colorado River are administered by the U.S. Bureau of Reclamation.

The WSA lies entirely within southern Grand County. The current *Grand County Master Plan* (University of Utah, Bureau of Community Development, 1979) does not favor wilderness but does recognize the value of "areas of critical environmental concern," after an area has been tested for mineral potential. The plan generally emphasizes continuation of present uses and maximizing mineral development. The WSA is not specifically mentioned in the plan. However, the Grand County Commission is strongly opposed to wilderness designation for Negro Bill Canyon.

Socioeconomics

DEMOGRAPHICS

The socioeconomic effects of wilderness designation or nondesignation would be confined primarily to the Moab area. Grand County can be characterized as rural and sparsely populated. The 1982 county population was 8,100, less than 1 percent of the State population of about 1.5 million (Utah Office of Planning and Budget, 1984). The majority of the county is unpopulated, with 97 percent of the settlement concentrated in the Moab area. About 65 percent of the county's population lives in Moab, which is approximately 4 road miles from the WSA.

About 80 percent of the county is owned by the Federal Government, 15.5 percent by the State, and 4.5 percent by private landowners.

EMPLOYMENT

Recent statistics show that 99 percent of local wage and salary employment is nonfarm, with about 17 percent employed in Federal, State, and local governments (refer to Table 9). Mining and tourism are the most important private industries in Grand County. Mining directly accounts for 25 percent of local employment; however recent mining and milling layoffs may reduce mining's local importance. Tourism directly accounts for approximately 12 percent of local employment. The mining and tourist industries purchase some of their supplies locally, and those who work in these industries spend part of their income locally. This circulation of money from export industries contributes to local income and employment. Including these multiplier effects, mining and tourism account for 35 to 45 percent and 17 to 25 percent of local employment, respectively. Unemployment in the county is among the highest rates in the State with 1982 quarter figures of approximately 18 percent. This is due primarily to large mine layoffs and the resulting downturn through the local economy.

INCOME AND REVENUES

Economic-related activities in the WSA include mineral exploration, livestock production, and recreation. Table 10 summarizes local income and Federal revenues from the WSA. Appendix 9 identifies the multipliers used to estimate income and revenues.

TABLE 9
1981 Income and Employment
Grand County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	1	Less than 1
Total Agriculture	1	Less than 1
Mining	34	25
Construction	7	5
Manufacturing	1	Less than 1
Transportation and Public Utilities	10	8
Wholesale Trade	10	8
Retail Trade	10	18
Finance, Insurance and Real Estate	3	2
Services	11	16
Other	-	-
Total Private Industry	85	82
Federal Government	5	6
State and Local Government	9	10
Total Government	14	17
Total Nonagricultural	99	99
Unemployment (1st Quarter, 1983)		18
	(Dollars)	(Jobs)
Total Employment and Earnings	$52,753,000	3,617
Total Personal Income	$75,404,000	

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1983.

Note: Because of rounding, numbers are additive. Total and percentage income figures include wage, salary, and proprietors' income. Employment percentage figures include only wage and salary employment. The relative importance of farm equipment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other.

TABLE 10
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	$6,780
Mining Claim Assessment	$18,500	None
Livestock Grazing	$4,000	$280
Recreational Use	Less than $15,250	$100
Total	Less than $37,750	up to $7,160

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total local income that would be generated by these expenditures.

The WSA has 185 mining claims. Regulations require a $100 annual expenditure per claim for labor and improvements, an undetermined part of which is spent in the local economy.

The geophysical exploration that has been conducted in the WSA has generated some temporary local employment and income. No oil and gas or mineral production has occurred in the WSA. Therefore, mineral and energy resource production from the WSA has not contributed significantly to local employment or income.

One livestock operator has a total grazing privilege of 200 AUMs within the WSA. If all this forage were utilized, it would account for $4,000 of livestock sales and $1,000 of ranchers' returns to labor and investment.

No woodland products have been harvested from the WSA.

The WSA's nonmotorized recreational use is moderate. Related local expenditures are low, well distributed, and could only be significant to the one commercial outfitter who currently uses the WSA. The WSA's motorized recreational use is low and related local expenditures are low and insignificant. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per noncommercial recreational visitor day for all types of recreation in Utah are approximately $4.10. The noncommercial recreational use for Negro Bill Canyon WSA is estimated as about 2,500 visitor days per year. In addition, the commercial operation would make approximately $5,000 annually in sales based on the land-based commercial average of $50 per commercial user day. Only a portion of the expenditures for recreational use of the WSA contribute to the local economy of Grand County.

The WSA generates Federal revenues from mineral leases, livestock, and recreation sources (refer to Table 10).

Oil and gas leases in the WSA cover approximately 2,260 acres. At $3 per acre, lease rental fees generate up to $6,780 of Federal revenues annually. Half of these monies are allocated to the State, which then reallocates these revenues to various funds, the majority of which are related to energy development and mitigation of local impacts of energy and mineral development.

Average actual livestock use and, therefore, revenues generated from grazing in the WSA are unknown; however, the permittees in the WSA

can use up to 200 AUMs per year. Based on a $1.40 per AUM grazing fee, the WSA can potentially generate $280 of grazing fee revenues annually, 50 percent of which would be allocated back to the local BLM district for the construction of rangeland improvements.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for all Alternatives

1. The alternatives would be carried out as cited in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs b SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable energy resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative (Proposed Action)

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown but would probably be low to moderate. Although the area has moderate resource favorability for oil and gas, potash, and uranium/vanadium, its reserves are unproven and management restrictions and economics could limit production. The following is a worst-case analysis based on the assumption that minerals would be developed sometime in the future and would cause the following disturbance: oil and gas, 310 acres; manganese, 45 acres; potash, 420 acres ;and uranium 40 acres. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed by the State of Utah as a PSD Class II area. Disturbance of 815 acres would result in minor increases in fugitive dust emissions.

GEOLOGY

No impacts to geology are expected because surface disturbances associated with locatable minerals, potash, and oil and gas exploration and development activities would probably not exceed 815 acres. The disturbance would probably be largely in the form of roads and drill pads, which would not significantly alter the geological character of the affected area.

SOILS

It is estimated that up to 815 acres of soil could be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.42 cubic yard/acre/year. If disturbed, soil loss would increase to 2.2 cubic yards/acre year. Soil loss on the 815 acres would increase from 342 cubic yards/year to 1,793 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined. Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 1,451 cubic yards (45 percent) over current annual soil loss. The likelihood of this occurring is low because soils subject to severe or critical erosion tend to occur as pockets of fine sandy soil could be avoided.

VEGETATION

The anticipated maximum of 815 acres disturbed could result in loss of as much as 15 percent of the area's sparse egetation until reclamation is completed. No major changes in vegetation type would be expected. Reclamation efforts could possibly benefit vegetation growth in the long term.

There are no known sensitive, threatened, or endangered plant species in the WSA. Some individual plans of the rare species *Aquilegia micrantha* could be lost, but care would be taken to protect the species in the area as a whole through protective stipulations.

WATER RESOURCES

Impacts to water interrelate closely to soils. Where surface disturbance occurs, increased sediment yield can affect water quality. Surface disturbance from mineral exploration and development would impact 815 acres under this alternative, with a soil loss increase of approximately 1,451 cubic yards/year (45 percent).

The loss in quality of surface and ground water resources would be significant if expected surface disturbance could not be mitigated to avoid a soil loss increase of this magnitude. Also, potash development has the potential for reducing ground water quality.

Opportunities for maintenance, improvement, or expansion of existing water sources could occur as allowed in the Grand RMP. No water developments are currently planned for the WSA.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Oil and gas categories in the WSA would remain the same (5,765 acres open, 420 acres open with special stipulations, 1,405 acres open with no surface occupancy, and 30 acres of no leasing). Wilderness protection stipulations on post-FLPMA leases would be lifted, and there would be 5,330 currently unleased acres available for lease.

The WSA is estimated to have 10 to 50 million barrels of oil and 60 to 300 billion cubic feet of natural gas in-place. Of this amount, 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas are considered recoverable. These oil and gas resources could be explored and developed without concern for wilderness values. Favorability for occurrence of oil and gas in the Mississippian Formations is seen as fairly high for the WSA; however, drilling that has taken place around the WSA does not support this occurrence. It is, therefore, uncertain whether development of oil and gas within the WSA will take place.

Potash

The entire WSA would be open to potash leasing and development. The potash-bearing zones under the WSA are estimated to be well below 7,000 feet. Although approximately 75,000 to 7.5 million tons of potash may be recoverable within the WSA, it is doubtful that potash at these depths in the Paradox Basin would ever be exploited, even by in-situ methods, considering that more favorable areas exist elsewhere in the basin.

Locatable Minerals

Locatable mineral development could occur within the WSA without concern for wilderness values. The entire 7,620 acres would remain open to mining claim location. The potential deposit of 500 to 1,000 tons of uranium oxide and vanadium, less than 50,000 tons of copper, and less than 100,000 tons of manganese could be developed. Vanadium, copper, and manganese are all currently listed as strategic and critical minerals. The largest percentage of favorable mineral deposits occur beneath the surface of the WSA. It is unlikely that copper or manganese would be developed due to low resource potential. There is some potential for uranium development due to its moderate favorability. Rugged terrain characteristics of the WSA would increase the cost of subsurface exploration or development.

WILDLIFE

Wildlife could be adversely affected by possible surface-disturbing activities (815 acres) and ORV use where allowed. Surface-disturbing activities could possibly occur within the 3,353 acres of deer winter range or along 610 acres of crucial riparian habitat. Disturbance and habitat loss would be short term while work was ongoing, and habitat could be enhanced over the long term by reclamation and revegetation. Wildlife species could die or move out if crucial riparian habitat or winter range were disturbed and might or might not return after activities ceased. This is especially true if access were developed and human occupation were to increase greatly from mineral development. No habitat improvement or wildlife transplants are planned for the area. No threatened or endangered species are known to be within the WSA. Still, potential habitat exists for bald eagles, American peregrine falcons, and spotted owls (all endangered). Also, the golden eagle, a BLM sensitive species, inhabits the area.

Before authorizing surface-disturbing activities (815 acres potential) the BLM would conduct site-specific clearances of the potentially disturbed areas and would informally consult with the FWS as required by BLM policy (refer to Appendix 4). If threatened or endangered species could be affected, the BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken to protect these animals, it can be reasonably concluded that the viablity of populations of threatened, endangered, or sensitive animal species would be preserved under the No Action Alternative.

FOREST RESOURCES

The entire area would be open to woodland product harvest; however, there is no harvest of forest products at the present time, nor is any planned. planned. Some juniper and pinyon trees could be lost during mineral development. However, no significant loss or harvest of forest resources would be anticipated.

LIVESTOCK

Domestic livestock grazing would continue as authorized in the Grand RMP. The 200 AUMs currently allocated in the WSA are controlled by one livestock permittee. Additional roads or other facilities for livestock handling could be proposed and developed in the future without regard for wilderness values. Existing range facilities (0.25-mile fence and one small stock reservoir) could be maintained by mechanical methods. Motorized vehicles are currently used very little to manage livestock in the WSA and the 1,375-acre vehicular closure would have little effect on livestock management. Overall, few, if any, changes in livestock management techniques are expected. Livestock forage could be reduced by as much as 15 percent from mineral and energy related disturbance. However, only about 25 percent of the AUMs in the North Sand Flats grazing allotment are within the WSA and the actual AUMs used are even less; therefore, the impact to livestock operations would be insignificant. New rangeland developments could be implemented without wilderness considerations, although none are currently planned.

VISUAL RESOURCES

Under this alternative, visual quality in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., about 1,375 acres would be closed to ORV use; 30 acres would be closed to oil and gas leasing; 1,405 acres would be open to leasing with no surface occupancy; and 4,190 acres would be managed under VRM Class I objectives requiring that activities not be apparent).

However, under this alternative, 815 acres of mineral-related exploration and development are possible. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. VRM objectives would probably not be met in Class II areas during the short term. Even after rehabilitation, some permanent localized degradation would be expected. If roads, vehicular ways, and drill pads are located throughout the area (worst-case analysis), visual quality could be significantly reduced in the WSA as a whole. Within the 3,430 acres under VRM Class IV, management objectives could probably be met.

CULTURAL RESOURCES

Protection of cultural values would continue as currently provided. There is a potential for 815 acres of surface disturbance by mineral exploration and development under this alternative; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance. Inadvertent loss or damage could occur in the disturbed areas. The overall effect on cultural resources us unknown. There are no existing National Register sites within the WSA; however, some of the sites do have National Register potential.

RECREATION

About 6,245 acres would remain open for vehicular use in accordance with the RMP, and about 1,375 acres would be closed to ORV use. This closure would not apply to the 0.5 mile of road at the mouth of Negro Bill Canyon or to other ways and trails in the upper portions of the WSA. It would apply mainly to the Negro Bill Canyon drainage including 1.0 mile of the road.

Primitive recreation values could be foregone in those areas where potential mineral and energy surface-disturbing activities could take place (815 acres). However, overall recreational use of the WSA could be expected to increase as the State population increases. The amount of future increase in recreational use of the WSA is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20

years. At this rate, overall recreational use is expected to increase from 2,600 current visitor days per year to 3,870 visitor days at the end of 20 years. Assuming that the 2-percent increase would be uniform among all recreation uses in the WSA, primitive recreational use would increase from the estimated current use of 2,100 visitor days per year to about 3,130 visitor days per year over the next 20 years. Likewise, recreational activities utilizing vehicular access (hunting, sightseeing, etc.) would increase from 600 visitor days per year to 740 visitor days.

WILDERNESS VALUES

None of the 7,620-acre area would be designated wilderness, and management would be under the Grand RMP. Under this alternative, wilderness values in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., about 1,375 acres would be closed to ORV use; 30 acres would be closed to oil and gas leasing; 1,405 acres would be open to leasing with no surface occupancy; and 4,190 acres would be managed under VRM Class II objectives requiring that activities not be apparent).

However, under this alternative, 815 acres of mineral exploration and development are possible. The related surface disturbance could result in a significant loss of portions of the areas with naturalness, outstanding opportunities for solitude (1,375 acres), and outstanding primitive and unconfined recreation opportunities (2,300 acres) if roads, vehicular ways and drill pads are located throughout the area. Opportunities for solitude and primitive and unconfined recreation could be lost or reduced, not only due to surface disturbance, but also due to allowance of motorized uses. The potential for some mineral development and related disturbance to take place is rated as moderate in this WSA.

LAND USE PLANS AND CONTROLS

This alternative would generally be consistent with the *Grand County Master Plan* because existing uses would continue. However, continuation of the 30-acre closure to oil and gas leasing would probably not be consistent with the county's policy of emphasizing mineral development. This alternative would be consistent with plans and policies of the State of Utah and would be in conformance with BLM's Grand RMP.

SOCIOECONOMICS

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the oil and gas, uranium/vanadium, potash, copper, and manganese in the WSA were developed it would lead to a significant increase in employment and income for Grand County. However, although the favorability for finding minerals within the WSA is moderate, the probability of their development is low to moderate (refer to the Mineral and Energy Resources section for a description of mineral and development potentials.)

There would be no livestock-related economic losses because the potential grazing use (200 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase over the next 20 years to 3,870 visitor days/year and overall recreation-related expenditures average $4.10 per visitor day for noncommercial use (3,723 visitor days), and $50 per visitor day for commercial use (147 visitor days) (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA (up to $22,368) would likely not be significant to the local economy except to outfitters that may use the area.

Surface-impacting activities that would be allowed without designation could reduce the demand for commercial outfitter services now offered in the area. Decreased demand would be significant to the one commercial outfitter who uses the WSA but would be insignificant in terms of the local economy and other individual businesses.

Federal and State revenues would not be reduced by this alternative. There are 5,300 acres in the WSA open to oil and gas leases that are currently not leased. If leased they would bring up to $15,990 additional Federal lease fee revenues per year in addition to new royalties from lease production. Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees ($280 per year) would continue.

All Wilderness Alternative (7,620 Acres)

As cited in the description of the Alternatives section, major changes that could occur in the area would be related to its withdrawal from mineral location and closure to new mineral leasing and

sale. The entire area would be placed in Category 4 (closed to leasing) and would also be closed to ORV use. The WSA would be managed under VRM Class I which allows for only natural ecological change.

For the following analysis it is assumed that existing mining claims would eventually be explored or developed, causing an estimated 85 acres of disturbance within the WSA. It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing would not be allowed.

Because potentially disturbed areas would be smaller than under the No Action Alternative (85 vs. 815 acres), the impacts from development and surface disturbance on air quality, geology, livestock, wildlife, forest, and cultural resources would be insignificant under the All Wilderness Alternative. Wilderness designation would provide additional protection to these resources because it would reduce the potential for disturbance as compared to the No Action Alternative. Other effects on these resources due to changes in management are discussed below.

SOILS

The soil resource could benefit from the All Wilderness Alternative because of the reduced likelihood of surface-disturbing activities.

It is estimated that up to 85 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about .42 cubic yard/acre/year. If disturbed, soil loss would increase to 2.2 cubic yards/acre/year. Soil loss on the 85 acres would increase from 36 cubic yards/year to 187 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined. Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 151 cubic yards (5 percent) over current annual soil loss. This is 1,300 cubic yards/year less soil loss than could occur under the No Action Alternative. There would be a 102-percent decrease of soil loss under this alternative as compared to the No Action Alternative.

VEGETATION

The anticipated maximum of 85 acres disturbed could result in loss of as much as 2 percent of the area's sparse vegetation as compared to as much as 15 percent loss under the No Action Alternative. No major changes in vegetation type would be expected. This alternative would give added protection to the rare species of plant *Aquilegia micrantha* because of reduction in potential surface disturbance.

WATER RESOURCES

Impacts to water interrelate closely to soils. Where surface disturbance occurs, increased sediment yield can affect surface water quality. Surface disturbance from mineral and energy exploration and development would impact 85 acres under this alternative. It is expected that an 5-percent increase in soil loss could occur as compared to the 45 percent increase under the No Action Alternative. Because of the reduction in potential soil loss and because potash development with the potential for degrading ground water would not occur, the quality of both ground and surface water would not be significantly reduced under this alternative.

Under this alternative, opportunities for maintenance, improvement, or expansion of existing water sources could be limited to protect wilderness values. No improvements are currently planned.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Approximately 2,260 acres (760 acres pre-FLPMA and 1,500 acres post-FLPMA) are under oil and gas leases. No exploration or development of oil and gas is presently occurring within the WSA. Existing pre-FLPMA and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases will be developed or a showing of commercial quantities made prior to their expiration dates, and expired leases will not be reissued.

The WSA is believed to be geologically favorable for the moderate occurrence of oil and gas, with an estimation of 3 to 15 million barrels of recoverable oil and 18 to 90 billion cubic feet of recoverable natural gas that could be foregone under this alternative.

Potash

Under this alternative, the area could not be leased for potash. It is assumed that there are 75,000 to 7.5 million tons of recoverable potash that could be foregone. However, the potash-bearing zones under the WSA are estimated to be well below 7,000 feet. It is doubtful that the potash resource at these depths would be explored or developed even without wilderness designation due to more favorable areas elsewhere.

Locatable Minerals

Approximately 3,450 acres are under mining claim within the WSA, principally for uranium. Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation under unnecessary or undue degradation guidelines, with consideration given to protecting wilderness values. If minerals are located prior to wilderness designation, it is estimated that up to 85 acres could be disturbed due to exploration and development of locatable mineral resources. The worst-case impact to minerals would occur if the potentially recoverable minerals are not within mining claims filed before designation. In that case, the potential for recovery of up to 50,000 tons of copper, 100,000 tons of manganese, and 500 to 1,000 tons of uranium oxide and vanadium could be foregone under this alternative. Vanadium, copper, and manganese are all currently listed as strategic and critical minerals. The largest percentage of favorable mineral deposits occur beneath the surface of the WSA. Rugged terrain would increase the cost of subsurface exploration or development. It is unlikely that copper or manganese would be developed even without wilderness designation because of this and low resource potential.

WILDLIFE

Wildlife would benefit from the preservation of solitude and the reduction of surface-disturbing activities (815 acres to 85 acres) and from the 1,375-acre ORV closure. Some of the surface disturbance could possibly occur within the 3,353 acres of deer winter range or along the 610 acres of crucial riparian habitat. Disturbance and habitat loss would be short term while work was ongoing, and habitat could be enhanced over the long term by reclamation and revegetation. It is less likely that crucial riparian habitat or winter range would be significantly reduced under this alternative. Mobile animals would temporarily leave the area of disturbance and less mobile animals would remain under less viable conditions, but it is unlikely that any species would permanently leave the area of the WSA.

LIVESTOCK

Present domestic livestock grazing would continue as authorized in the Grand RMP. The 200 AUMs currently allocated in the WSA are controlled by one livestock permittee. Existing developments (a 0.25-mile fence and one small stock reservoir) could be used and maintained in the same manner as in the past, based on practical necessity and reasonableness. New rangeland developments would be allowed on a case-by-case basis if necessary for resource protection (rangeland and/or wilderness) and the effective management of these resources, provided that wilderness protection standards are met. Development of livestock management facilities could be restricted to preserve wilderness values. However, no facilities are currently planned or likely to be planned for the area in the future. The area-wide vehicle closure should have little effect on livestock management because vehicles are used very little to manage livestock.

VISUAL RESOURCES

Wilderness designation would contribute to the preservation of the area's visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through ORV closure, and through closure of the entire area to future mineral leasing and location.

Under this alternative the possible mineral-related disturbance would be reduced from 815 acres to 85 acres, associated with development of valid mining claims. Although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation, some permanent localized degradation could be expected. If roads for development of valid mining claims could not be denied (worst-case analysis), VRM Class I objectives might not be met on large portions of the WSA. However, the potential for the visual quality to be reduced in the WSA as a whole is much less under this alternative than under the No Action Alternative.

CULTURAL RESOURCES

Approximately 85 acres could be disturbed by mineral exploration and development; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any and all proposed surface disturbance and would mitigate any adverse impacts. Inadvertent loss or damage to cultural resources could occur, although these impacts are expected to be minimal.

There is potential for increased vandalism to cultural resources due to increased recreational use of the WSA. However, protection afforded by wilderness management would outweigh any potential vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

The WSA has outstanding primitive recreational values. If designated, those high-quality opportunities would be recognized, managed, and protected through the ORV closure, mineral leasing and location closure, and through management under VRM Class I (which allows for natural ecological change only).

If roads for development of valid mining claims could not be denied, the quality of primitive recreational opportunities would be reduced. Because the potential mineral-related disturbance would be reduced, the quality of the primitive recreational experience would likely be preserved under this alternative.

The entire 7,620 acres would be closed to recreational ORV use instead of 1,375 acres as identified in the Grand RMP. This closure would apply to 1 mile of the 1.5-mile road at the mouth of Negro Bill Canyon (approximately .5 mile of the road up Negro Bill Canyon is "cherry-stemmed" and would remain open to vehicular access) and to ways and trails in the upper portions of the WSA. These routes are used primarily for mining claims and recreational access, and use accounts for about 500 ORV visitor days/year. Similar nearby areas would continue to be available to ORV-type recreation, so little impact on this type of use would be expected.

As dicussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an undetermined increase in primitive recreational use above the baseline rate. Judging from use densities of a number of primitive areas, wilderness and proposed wilderness areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites, it is estimated that, following designation, use could be as much as 3,810 visitor days/year (USDI, BLM, 1985). This is 1,210 visitor days (47 percent) over the area's current estimated 2,600 annual visitor days.

Although primitive use would increase it likely would not fully offset the loss of ORV use within the WSA. Therefore, overall recreation use in the WSA would be slightly less than with the No Action Alternative.

It is concluded that primitive recreational-type values would be enhanced through specific management and potential increases in recreational use would be controlled.

WILDERNESS VALUES

Wilderness designation would contribute to the preservation of the area's wilderness characteristics including 7,020 acres having naturalness, 1,375 acres having outstanding opportunities for solitude, and 2,300 acres having outstanding primitive recreation opportunities. The special feature of a perennial stream in Negro Bill Canyon would also be protected. Under this alternative, the potential for surface-disturbing activities that could impair wilderness values would be reduced through management under VRM Class I (which generally allows for only natural ecological change), ORV closure, and closure of the entire area to future mineral leasing and location.

No development of leases is foreseen under this alternative. The possible mineral-related surface disturbance would, therefore, be reduced from 815 acres to 85 acres for development of valid mining claims. Mitigation to protect wilderness values would be considered during mining claim development, but road construction and use of motorized equipment could be allowed if there were no reasonable alternatives.

There are about 3,450 acres of the WSA (45 percent) under mining claims. Naturalness, solitude, and primitive and unconfined recreation opportunities on the affected areas could be lost or at least reduced until satisfactory reclamation was conducted. However, because possible mineral-related development would be reduced under this alternative and mitigation would be imposed to protect wilderness values, loss of wilderness values in the area as a whole would be much less likely under this alternative than if the area is not designated as wilderness.

LAND USE PLANS AND CONTROLS

Wilderness designation would not be consistent with the *Grand County Master Plan* of maximizing mineral development. It would, however, not totally conflict with the plan's multiple-use concept since many existing uses would continue, although under more restrictive conditions. The Grand County Commission is strongly opposed to wilderness designation of Negro Bill Canyon and this alternative would not be consistent with their policies. The Grand RMP does not provide for wilderness designation. A decision by Congress to designate the WSA as wilderness would be an amendment to the BLM Grand RMP. Because there are no State lands within the WSA, wilderness designation would not interact with State of Utah plans.

SOCIOECONOMICS

Overall there would be no significant changes in current trends of population, employment, and local income distribution.

Because of restrictions placed on the use of resources under wilderness designation there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 10) as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative.

The potential for mineral development in the WSA is low to moderate (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Valid existing oil and gas leases and mining claims could be developed but designation would preclude new leases and claims from being established in the WSA. Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they would be with mineral development under the No Action Alternative. Because the potential for some mineral development is moderate, it is estimated that potential mineral-related local income could be significantly reduced by wilderness designation. Any local income related to assessment of future mining claims would be lost.

Livestock use and ranchers' income would continue as at present with $4,000 of livestock sales and $1,000 of ranchers' return to labor and investment. No potential range improvements have been proposed that would result in increased ranchers' income.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section). Related local expenditures would average $4.10 per visitor day for noncommercial use (3,663 visitor days) and $50 per visitor day for commercial use (147 visitor days statewide) and would only be significant to the one commercial outfitter now using the WSA and those that may begin to use the WSA.

Motorized recreational use of the WSA is light (500 visitor days per year). The decrease in related local expenditures due to ORV closure would be small and insignificant to both the local economy and individual businesses.

The loss of 2,260 acres now leased would cause an eventual loss of up to $6,780 per year of lease fees to the Federal Treasury. There would also be a potential loss of $15,990 annually in Federal revenues from the 5,330 acres that could be leased without designation. In addition to these rental fees, any potential royalties from new lease production could also be foregone.

Recreation-related Federal revenues could increase if the demand for commercial outfitter services increases. There is presently one commercial outfitter using the WSA and designation could lead to more commercial recreational use in the WSA.

Federal revenues from livestock grazing would continue as with the No Action Alternative.

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Horseshoe Canyon (North) WSA

HORSESHOE CANYON (NORTH) WSA

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HORSESHOE CANYON (NORTH) WSA

(UT-060-045)

INTRODUCTION

General Description of the Area

The Horseshoe Canyon (North) Wilderness Study Area (WSA) is in the San Rafael Desert region of Emery and Wayne Counties, Utah. It is about 55 road miles from the Town of Hanksville and about 40 road miles from Green River. The WSA contains approximately 20,500 acres of BLM-administered land. Approximately 1,920 acres are in Wayne County and 18,580 acres are in Emery County. The WSA is comprised of three major drainages to the Green River-Labyrinth Canyon drainage. It is roughly 12 miles long, northeast to southwest, and 8 miles wide, east to west.

The WSA's topography can be divided into three categories: sandy flats in rolling sandstone terrain, deep cut drainages, and river canyon bottoms.

The sandy flats and rolling terrain are perched above the intricate canyon system and provide vantage points to view the unique character of the Utah canyonlands. Elevations in this portion of the WSA are 4,600 to 5,100 feet.

The canyons of Horseshoe, Two Mile, and Keg Spring are deeply entrenched into the rolling terrain. They vary in depth from 150 feet at their heads to 1,000 feet as they meet the cut of Labyrinth Canyon of the Green River. The canyons are accessible from the higher country in only a few spots. Elevation varies from 4,000 feet at the base of the canyons to 5,000 feet on their rims.

The river canyon bottom is thickly vegetated, while the dominant vegetation type over the rest of the WSA is the desert shrub-sagebrush type. Some side canyon bottoms contain small pour-offs and deep pools of water. Shade is offered by the tall-reaching walls of the drainages.

The area is an arid desert climate. Average annual precipitation is 6 to 8 inches, which occurs in the form of rain and snow. Temperatures range from 10 to 110 degrees Farenheit (F).

The WSA is located in the lower end of a canyon approximately 35 miles long, which is potential wilderness for its entire length. There are two management designations for the other portions of the canyon: the detached Horseshoe Canyon Unit of Canyonlands National Park and the Horseshoe Canyon (South) WSA (UT-050-237). The combined total acreage of the three contiguous areas is almost 62,000 acres.

Specific Issues Identified in Scoping

General issues pertaining to the WSAs in the San Rafael Resource Area are discussed in Volume I. Several concerns pertaining to the wilderness study process and/or the environmental analysis process were also raised during scoping. These concerns are discussed in the Scoping section of Volume I rather than in analyses for individual WSAs. Three issues and concerns specific to Horseshoe Canyon (North) WSA were raised in the public scoping process (USDI, BLM, 1984) and are responded to below:

1. *Comment:* Soil and erosion control issues should be analyzed in the Environmental Impact Statement (EIS).

   Response: Soil and erosion are discussed in the Affected Environment and Environmental Consequences sections of this analysis. Erosion control from natural events by terraces, dikes, etc., has not been planned in this area. Erosion control for disturbed areas is provided by the San Rafael Resource Area Management Framework Plan (MFP).

2. *Comment:* Does the area have important oil and gas potential?

   Response: Oil and gas potential is discussed under Affected Environment, Leasable Minerals section. The area is estimated to have a low potential for oil and gas.

3. *Comment:* Wilderness designation would protect the Green River, a Nationwide Rivers Inventory segment with potential for study and addition to the National Wild and Scenic Rivers System.

   Response: The status of the Green River study is noted in the Affected Environment,

Recreation section. If the WSA is not designated wilderness, the segment of the Green River within the WSA with potential for study and addition to the National Wild and Scenic Rivers System would continue to be managed under provisions of the August 2, 1979 Presidential Memorandum regarding Wild and Scenic Rivers and National Trails. In an August 1980 Council of Environmental Quality Memorandum, specific actions were outlined for interagency consultation to avoid or mitigate adverse effects to rivers on the Nationwide Rivers Inventory. These procedures are required as part of the environmental analysis process regarding any proposed action that could impact an inventory river. If the WSA were designated wilderness, a small portion of the Green River's outstanding values would be protected by reduced potential for surface-disturbing activities such as building; however, much of the Green River is not within the WSA. In the WSA, the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964) and the BLM's "Wilderness Management Policy" (USDI, BLM, 1981) would be used as a guide to determine permissible activities.

4. *Comment:* The oil and gas (mineral) potential of the WSA is ranked low by Science Applications, Inc. (SAI, 1982). Based on proprietary information, representatives of the oil and gas industry believe the potential of the WSA to be moderate to high. This information should be considered in the Draft EIS.

Response: At this time BLM has not made an independent assessment of geologic information gathered by oil and gas companies. The SAI (1982) report will be used as the reference on oil and gas potential for this EIS, but information provided by the oil and gas industry and available mineral investigation reports by the USDI, Geological Survey and Bureau of Mines will be reviewed by BLM prior to making final wilderness recommendations to the Secretary of the Interior.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated from Detailed Study

No alternatives were identified for consideration other than those analyzed.

Alternatives Analyzed

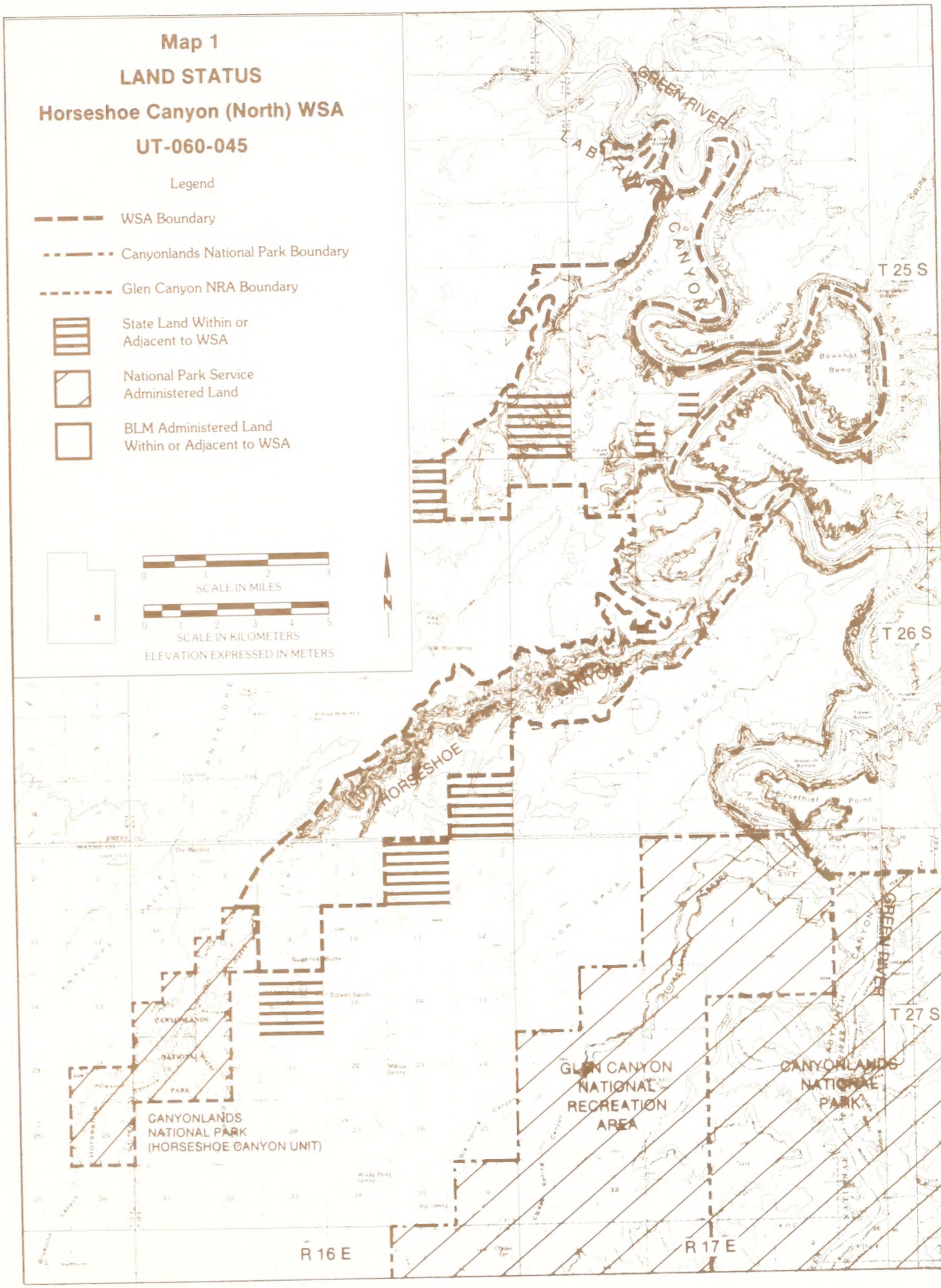
Two alternatives are analyzed for this WSA: (1) No Action; (2) All Wilderness (20,500 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

With this alternative, none of the 20,500-acre Horseshoe Canyon (North) WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the San Rafael MFP on 28,580 acres (USDI, BLM, 1979a) (until superceded by the San Rafael Resource Management Plan [RMP] scheduled for completion in 1988), and the Henry Mountain MFP (USDI, BLM, 1982c) on 1,920 acres. The State land within the WSA (refer to Map 1) has not been identified in the MFP for special Federal acquisition through exchange or purchase. State lands are analyzed as remaining under State ownership. Refer to Volume I for further information on State in-holdings.

The following are specific actions that would take place with this alternative:

- All 20,500 acres of the WSA would remain open to mineral location, leasing, and sale. Development work, extraction, and patenting would be allowed on 21 existing mining claims (360 acres) and future mining claims. Development would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809). Existing oil and gas leases (16,540 acres) and future leases could be developed under Category 1 (standard stipulations) on 14,860 acres and Category 3 (no surface occupancy) on 5,000 acres. No leasing on 640 acres (Category 4) would be allowed.
- The present domestic livestock grazing use would continue as authorized in the MFP (959 Animal Unit Months [AUMs]). Use and maintenance of the three developed springs, one pipeline, and three livestock trails (less than 1 mile in total length) would continue without concern for wilderness values. New range developments (none are planned) could be implemented without wilderness considerations.
- Developments for wildlife, water resources, etc. (none currently are planned) would be allowed without concern for wilderness


Map 1
LAND STATUS
Horseshoe Canyon (North) WSA
UT-060-045
Legend
WSA Boundary
Canyonlands National Park Boundary
Glen Canyon NRA Boundary
State Land Within or Adjacent to WSA
National Park Service Administered Land
BLM Administered Land Within or Adjacent to WSA
SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
GREEN RIVER
LABYRINTH CANYON
T 25 S
T 26 S
T 27 S
HORSESHOE CANYON
GREEN RIVER
CANYONLANDS NATIONAL PARK (HORSESHOE CANYON UNIT)
GLEN CANYON NATIONAL RECREATION AREA
CANYONLANDS NATIONAL PARK
R 16 E
R 17 E

values if in conformance with the applicable BLM land use plan. A possible future dam and reservoir on the Green River bordering the WSA could be allowed; as an alternative a future Wild and Scenic River could be designated. Reintroduction of peregrine falcons is planned.

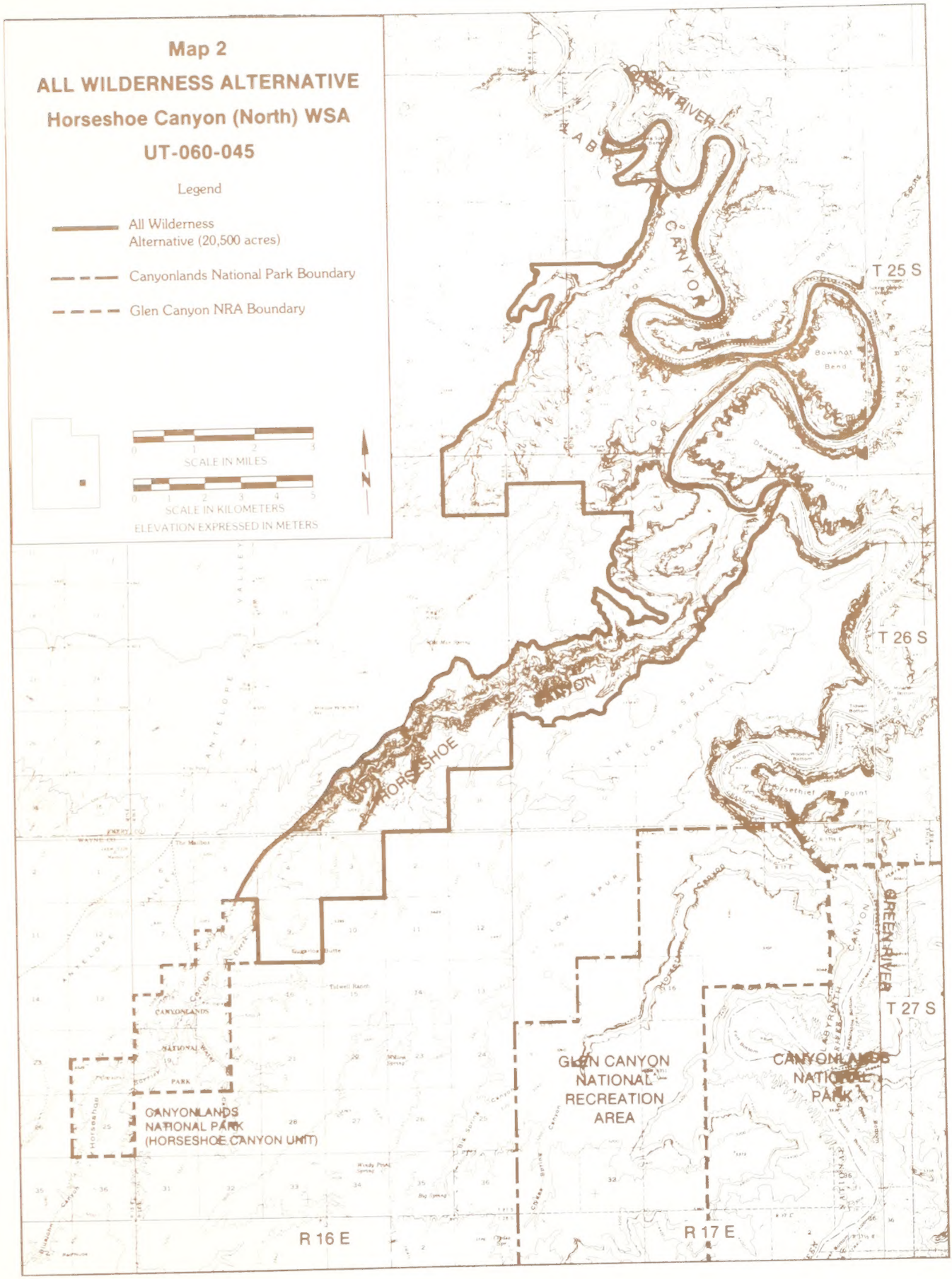
- The entire WSA acreage would be open to vehicular use and new access routes could be allowed. The two ways (1.25 miles) located atop the mesa in the central portion of the WSA would remain open.
- The entire 20,500-acre area would continue to be closed to woodland product harvest. There is no harvest of forest products at the present time, nor is any planned. Commercial harvest of pinyon-juniper for firewood, fenceposts, or Christmas trees currently is not allowed.
- The entire area would continue to be managed under Visual Resource Management (VRM) Class II (20,500 acres).
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate without concern for wilderness values.

ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

With this alternative, all 20,500 acres of the Horseshoe Canyon (North) WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). It would be managed in accordance with the BLM "Wilderness Management Policy" to preserve its wilderness character. On designation, one full section and parts of two other sections (about 800 acres total) of State land likely would be acquired into Federal ownership by purchase or exchange (refer to Map 1). Four State sections outside of, but adjacent to, the WSA would likely not be acquired. Should land transfers be made, it is assumed that management and types of impacts to former State in-holdings would be the same as those on adjacent Federal lands, and no specific analysis is given here. (Refer to Volume I for further information on State in-holdings.) The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located in the WSA.

The following are specific actions that would be taken with this alternative:

- After wilderness designation, all 20,500 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of the approximately 360 acres of 21 existing mining claims that may be determined valid. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809) with wilderness as a consideration. Twenty-six existing oil and gas leases involving 16,540 acres would be phased out on expiration unless a find of oil or gas in commercial quantities is shown.
- Present domestic livestock grazing would be allowed to continue as authorized in the San Rafael MFP. The 959 AUMs in the WSA would remain available to livestock as presently allotted. The use and maintenance of range developments existing at the time of designation (three spring developments, one pipeline, and three livestock trails) could continue in the same manner as in the past based on practical necessity and reasonableness. After designation, new developments (none are planned) would be allowed on a case-by-case basis if necessary for rangeland and/or wilderness resource protection and management, and if consistent with wilderness protection standards (refer to Appendix 1). A small group of wild burros (probably less than 10 animals) that frequent the WSA would continue to be allowed.
- New water resource facilities or watershed activities not related to range or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if


Map 2
ALL WILDERNESS ALTERNATIVE
Horseshoe Canyon (North) WSA
UT-060-045
Legend
All Wilderness Alternative (20,500 acres)
Canyonlands National Park Boundary
Glen Canyon NRA Boundary
SCALE IN MILES
SCALE IN KILOMETERS
ELEVATION EXPRESSED IN METERS
N
T 25 S
T 26 S
T 27 S
R 16 E
R 17 E
GREEN RIVER
HORSESHOE CANYON
CANYONLANDS NATIONAL PARK (HORSESHOE CANYON UNIT)
GLEN CANYON NATIONAL RECREATION AREA
CANYONLANDS NATIONAL PARK

authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act*. It is assumed that the potential Green River hydroelectric project development would not be allowed. Except as noted above, no water resource facilities or treatments are located in the Horseshoe Canyon (North) WSA, and none currently are planned.

- Wildlife transplants or improvements would be allowed after designation only if they are compatible with wilderness values. No wildlife projects are located in the WSA. Reintroduction of peregrine falcon is planned and would be allowed.
- The entire 20,500-acre area would be closed to off-road vehicle (ORV) use except for: (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) for occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. The approximately 1.25 miles of existing vehicular ways in the area would not be available for vehicular use except as indicated above. None of the WSA boundary follows existing gravel and dirt roads; however, four roads (jeep trails) dead-end at or near the WSA boundary, and these would remain open to vehicular travel.
- A specific Wilderness Management Plan would be developed to govern use and protection of the 20,500-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads that dead-end at the wilderness area boundary for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for noncommercial harvest of pinyon nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products at the present time, nor is any specifically planned.
- Visual resources in the wilderness area would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial techniques.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resource. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. A predator control program would be approved only upon clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences that would result from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparision of the alternatives.

AFFECTED ENVIRONMENT

This section briefly describes the affected environment. Unless otherwise indicated, information from this section was taken from the San Rafael

TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
HORSESHOE CANYON (NORTH) WSA

Resource	Alternatives: No Action	Alternatives: All Wilderness (20,500 Acres)
Water Resources	In the long term a hydroelectric power project could be constructed on the Green River bordering the WSA. As an alternative, a wild and scenic river could be designated.	The Green River near the WSA would remain in a free-flowing condition, with or without a wild and scenic river designation. A dam and reservoir would be foregone.
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 million barrels of oil, 18 billion cubic feet of natural gas, 1,000 tons of uranium oxide, 38,000 tons of copper, 750,000 to 7.5 million tons of potash, and 2 tons of manganese. About 165 megawatts of hydropower could be produced, although currently not proposed.	Oil, gas, and potish likely would not be recovered. The recovery of locatable minerals would also be foregone. Due to the low likelihood of recovery of these mineral resources, however, the loss of development opportunity would not be significant. About 165 megawatts of long-term potential hydropower would be foregone.
Wildlife	Up to about 20 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat, including endangered species.	Wildlife would benefit from solitude. Endangered species, including Green River fishes, would have wilderness protection in addition to Endangered Species Act.
Livestock	Grazing of 959 AUMs and maintenance of existing developments would continue. New developments could be constructed; however, none are now proposed.	Grazing of 959 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. Proposed new developments might not be allowed.
Visual Resources	The quality of visual resources could be impaired on up to 5,225 acres.	Visual quality could be impaired on up to 60 acres.
Recreation	ORV use would continue on 1.25 miles of ways at current low levels. Overall recreational use could increase from the present 2,140 visitor days per year to 3,189 over the next 20 years. Up to 225 acres of mineral-related disturbance could reduce the quality of primitive recreation. If constructed, a hydroelectric project would significantly change river recreation use patterns.	The WSA, including 1.25 miles of ways, would be closed to ORV use. Primitive recreational use could increase to 4,100 visitor days annually due to publicity associated with wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 5,225 acres (20 percent of the WSA), but the values in the rest of the WSA would not be affected, except through secondary influences.	Wilderness values would be protected, except on up to 60 acres (0.3 percent of the WSA) which may be disturbed by development of valid mineral rights.
Land Use Plans and Controls	This alternative would be consistent with the *Wayne County Master Plan* and the Emery County Zoning Resolution, State of Utah plans and policies, and the current BLM San Rafael and Henry Mountain MFPs. It would not complement the NPS proposal for wilderness in the adjacent detached unit of Canyonlands National Park.	This alternative would not be consistent with Wayne and Emery Counties' concepts of multiple use. It would be consistent with State policy if state in held lands are exchanged, and it would complement the NPS proposal for wilderness. Designation would constitute amendment of the BLM San Rafael and Henry Mountain MFPs.
Socio-economics	Annual local sales of less than $30,054 and Federal revenues of up to $50,963 would continue. An additional $9,960 per year in Federal revenues could be derived from leasing of presently unleased areas. In the long term, substantial economic gain may occur if a 165-megawatt hydroelectric project is constructed.	Annual local sales of less than $30,054 and Federal revenues of up to $1,343 would continue, but Federal revenues of up to $59,580 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.

Unit Resource Analysis (USDI, BLM, 1979a) and other BLM technical reports, documents and files.

Air Quality

The WSA is a Prevention of Significant Deterioration (PSD) Class II area as per the 1977 Clean Air Act Amendments. The WSA is adjacent to the 3,000-acre detached Horseshoe Canyon Unit of Canyonlands National Park, a PSD Class I area.

Potential pollution sources include industrial and vehicular emissions originating from the Castle Valley, Green River, and Moab areas. The nearest large point sources include coal-fired powerplants (about 64 air miles to the west) and uranium processing plants near Moab (about 25 air miles to the east). Fugitive dust is an intermittent, localized concern as a result of construction, traffic on dirt roads, and wind patterns. Visibility from canyon rims in the WSA is good, ranging from 30 to 100 miles.

Geology

The Horseshoe Canyon (North) WSA is in the Canyonlands Section of the Colorado Plateau Physiographic Province. It is located on the eastern edge of the San Rafael Desert and along the deep-cut drainages of Labyrinth Canyon of the Green River.

The WSA is near the northwestern margin of the Paradox Basin. Geologic formations outcropping in the WSA consist of sedimentary rocks which range from the Triassic Moenkopi to the Jurassic Carmel.

The Moenkopi Formation, an outcrop found in the WSA along the Green River from Bowknot Bend to Horseshoe Canyon, consists of red and buff, cross-bedded, medium-grained sandstone and mudstone, and green-gray and red shale conglomerate. Toward the base of the formation is a white to gray limestone with sandstone known as the Sinbad Limestone Member. This formation is an oil and gas producer.

Also exposed along the Green River from Bowknot Bend to Horseshoe Canyon is the Chinle Formation. This formation consists of sandstone, varigated shale, and conglomerate, all of which are lenticular and intertonguing. The formation is a uranium producer and composed of four members: Temple Mountain, Monitor Butte, Mossback, and Church Rock.

The Wingate Formation lines the major deep canyons within the WSA. It consists of buff, orange, and brown, massive cross-bedded, medium-grained sandstone marked by vertical jointing. It also contains minor amounts of shale conglomerate and lenses of cherty limestone.

The Kayenta Formation is situated along the major drainages in the higher elevations of the WSA. It is composed of red, argillaceous sandstone, cross-bedded in part with red and green shale and a siltstone-pebble conglomerate.

The Navajo Sandstone is a colorful formation found in the upper elevations of the WSA. The formation is a massive, medium-grained, cross-bedded sandstone. Tan, gray, orange, and yellow-colored caps appear as petrified dunes, circumscribed by fine pinkish sand lots. Lenses of limestone up to 5 feet thick occur in the upper half of the formation. Situated atop the deep canyon drainages and within this formation are several arches, caves, buttes, and knolls.

The Carmel Formation makes up only a small percentage of the WSA's surface. It consists of brown to gray sandy limestone, red thin-bedded sandstone, and red and green shale with beds of gypsum. It is Jurassic in age, and the limestone portion forms cliffs while the remainder forms a dip slope.

Soils

The WSA contains four general soil mapping units differentiated by river bottoms, canyons, mesas, and structural benches.

Both the wind and water actions could cause erosion problems in the WSA. Although there is a large proportion of the area in exposed bedrock, the rest of the ground is covered by sandy loam soils with sparse ground cover. Wind has the potential to be a major force in soil movement, especially if the surface is disturbed. Although rainfall is low, it tends to come in brief, intense thundershowers with flashflood runoff resulting in soil movement. Table 2 describes soil characteristics and land types and Table 3 describes erosion conditions.

Vegetation

The four major vegetation types in the WSA are listed in Table 4 and are summarized below. All four of the vegetation types, with the exception of the riparian type, are characterized by large areas of barren slickrock or sand. These are often cliff faces and rocky slopes. Juniper trees are also found in the different types but do not exceed a

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year) Present Condition	Bare Soil Surface
Rock Outcrop	35	7,175	0.0	0
Shallow loamy soils on sloping stuctural benches	40	8,200	1.0	5
Moderately deep to deep stony soils on steep canyon sides	15	3,075	1.0	10
Moderately deep to deep loamy and sandy soils on gently sloping valley floors and alluvial fans	10	2,050	0.1	1
Totals	100	20,500		

Source: Hansen, 1985.

total of 100 acres in the WSA. The most dominant vegetation type is the desert shrub-sagebrush which includes such species as Mormon tea, shadscale, rabbitbrush, snakeweed, blackbrush, fourwing saltbush, black sagebrush, big sagebrush, and wild buckwheat. Other sagebrush species occur in this type in lesser amounts and include bigelow, bud, pigmy, and fringed sagebrush. This vegetation type is most prominent on the flat lands above the Green River and Horseshoe Canyon.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Riparian	2,500	12
Grassland	1,100	6
Desert Shrub-Sagebrush	10,300	50
Desert Shrub	6,600	32
Total	20,500	100

Source: USDI, BLM, 1979a.

The desert shrub type is found along portions of the south and west boundary of the WSA and on Bowknot Bend which is considered a relic vegetation area. Dominant species in the type include Mormon tea, shadscale, rabbitbrush, snakeweed, blackbrush, fourwing saltbush, black sagebrush, and wild buckwheat.

The grassland vegetation type occurs in a few scattered, isolated areas near the Green River and in Horseshoe Canyon. This type is similar to the desert shrub-sagebrush and desert shrub vegetation types but is distinguished by a predominance of grasses over shrubs. The major grasses are curly grass, blue grama, Indian ricegrass, and

Table 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions Percent of Area	Acres	Cubic Yards	Annual Soil Loss if Disturbed Percent of Area	Acres	Cubic Yards
Very High	20.0	0	0	0	0	0	0
High	10.0	0	0	0	15	3,075	30,750
Medium	5.0	0	0	0	40	8,200	41,000
Low	1.0	55	11,275	11,275	10	2,050	2,050
Very Low	0.1	10	2,050	205	0	0	0
None	0.0	35	7,175	0	35	7,175	0
Totals		100	20,500	11,480[1]	100	20,500	73,800[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.56 under present conditions; 3.6 if disturbed.

sand dropseed. Other grasses include western wheatgrass, Fendler three-awn, needle-and-thread, and squirreltail.

The riparian vegetation type is located along the Green River and in Horseshoe Canyon. The Green River is a perennial water source for these streamside plant communities. Runoff from heavy and isolated showers also provides a water source for riparian vegetation. The most common plants in this type are tamarisk, cottonwood, black greasewood, rabbitbrush, snakeweed, and alkali sacaton.

There are no sensitive, threatened, or endangered plant species in the WSA. However, the endangered species *Oenothera megalantha* is known to occur just south of the WSA.

The Horseshoe Canyon (North) WSA is in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) types of the WSA are listed on Table 5. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

TABLE 5
Potential Natural Vegetation Types

PNV Type	Acres	Percent of WSA
Blackbrush	14,385	70
Galleta-threeawn shrub steppe	6,115	30
Total	20,500	100

Source: USDI, Geological Survey, 1978.

Water Resources

Making up the eastern boundary of the WSA, the Green River is a major perennial water source. Barrier Creek in Horseshoe Canyon and the majority of the springs in Keg Spring Canyon are also perennial (approximately 20 miles total). Flow in Barrier Creek may be interrupted in late summer.

Water in the WSA is used primarily by wildlife and livestock, with recreational boaters in Labyrinth Canyon of the Green River being a major non-consumptive use. Two potential damsites for water resources development on the Green River have been identified (refer to discussion on hydroelectric power). One spring in Keg Springs Canyon has been developed for livestock use. A pipeline (1 mile) has been used to carry water pumped out of the spring onto the flat, to the northwest. Two other springs, with private water rights, have also been developed.

Water quality is adequate for all existing uses; however, treatment is advisable for human consumption. Spring water quality generally is better than that of the Green River, although quality data are not available.

Mineral and Energy Resources

Each WSA was assessed for its energy and mineral resources by SAI (1982). The methodology used in the assessment is summarized in Appendix 5.

The mineral resource potential in the WSA is believed to be moderate. An overall importance rating (OIR) of 3 was assigned to the Horseshoe Canyon (North) WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. Shades of importance are indicated by + or -. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA. The primary reason for the moderate rating is potential for hydropower, potash, and uranium.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by the Federal Land Policy and Management Act (FLPMA). BLM and the Secretary of the Interior will also consider the reports prior to making final wilderness recommendations.

Table 6 indicates mineral and energy resources for the WSA.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in

TABLE 6
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f2	c2	Less than 10 million barrels of oil; less than 60 billion cubic feet of natural gas
Uranium/ Vanadium	f3	c3	500 to 1,000 tons of uranium oxide
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f4	c1	165 megawats
Copper	f2	c1	Less than 50,000 tons
Gypsum	f2	c1	None
Manganese	f2	c1	2 tons
Potash	f3	c3	1 to 10 million tons

Source: SAI, 1982[3].

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).
[3]SAI did not rate gypsum; however, BLM has added text information.

sufficient quantities to meet such a need. The WSA could contain deposits of vanadium, copper, and manganese that are currently listed as strategic and critical materials (Federal Emergency Management Agency, 1983). Although listed as strategic, copper is relatively common. Supplies currently exceed domestic demand.

LEASABLE MINERALS

No minerals are under lease in the WSA except oil and gas.

Oil and Gas

There are currently 26 existing oil and gas leases covering portions of the WSA (16,540 acres, 81 percent). The western portion of the WSA is within the Horseshoe Unit. With unitization, all of the leases are treated as one large lease and one of the lease holders is designated as the operator. In this case, the Horseshoe Unit was created in order to hold acreage. The existing leasing situation is shown in Table 7.

The WSA is included in the "Price District Oil and Gas Categories Environmental Analysis Report" (USDI, BLM, 1975). The results established oil and gas categories, which are shown in Table 8.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before

TABLE 7
Oil and Gas Leases

Type	Acres	Percent of WSA
Pre-FLPMA	15,490	76
Post-FLPMA	1,050	5
Availabe for Leasing Category 3	2,040	10
Available for Leasing Category 1	1,280	6
Not Available for Leasing Category 4	640	3
Total	20,500	100

Source: USDI, BLM, 1975.

TABLE 8
Oil and Gas Leasing Categories

Category	Acres	Percent of WSA
1. Open	14,860	72
2. Open with special stipulations	0	0
3. Open with no surface occupancy	5,000	25
4. Suspended or no lease	640	3
Total	20,500	100

Source: USDI, BLM, 1975.

wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

Across the Green River, 11 miles north of the WSA, is the Salt Wash Field which produces oil and gas from a Mississippian Formation. The field is a combination trap due to faulting (structural) and blanket sands (stratigraphic) and is small in

size. Within the WSA, however, the possibility is greater for stratigraphic traps.

The WSA is on the northwestern edge of the Paradox Basin, a very thick accumulation of sediment. Production to the east in Grand County is from the Hermosa and Mississippian Formations. The edge of the basin is considerably thinner than the center. Most production is from various structural traps, including folding, faulting, and salt intrusions.

Although no oil and gas wells have been drilled in the WSA, six have been drilled within 5 miles of the boundaries. All the wells have been plugged and abandoned, with two having oil or gas shows. The SAI favorability rating indicates that a potential exists within the WSA for less than 10 million barrels of oil or less than 60 billion cubic feet of natural gas. The certainty level indicates that some positive data exist within the vicinity of the WSA or on-trend with the WSA. Refer to Appendix 6 for estimates of recoverable resources. The extremely rugged surface in the majority of the WSA could make drilling uneconomical.

Potash

Potash occurs within an evaporite sequence (Paradox Member) in the Hermosa Formation. The formation is several thousand feet thick in the vicinity of Moab, where there is commercial extraction. The formation thins towards the west, making the formation within the WSA an estimated 2,000 to 3,000 feet thick. The SAI favorability rating for potash indicates a potential for 1 to 10 million tons of potash within the WSA. The certainty level indicates data showing a potash-bearing formation underlying the WSA. The SAI analysis also stated that the likelihood of this area being a target for exploration and possible development is very remote considering the thicker, richer potash deposits with less overburden occurring elsewhere in the Moab vicinity.

Coal

The WSA is considered geologically unfavorable for coal. Cretaceous coal-bearing strata either never were deposited or have been eroded away. The SAI rating for coal indicates there is no deposit and the certainty level indicates positive data supporting the rating.

Geothermal

The only geothermal potential associated with the WSA is deep-seated, low temperature thermal waters (between 20 and 90 degrees Centigrade [C]). On the basis of the geologic characteristics, SAI indicates there is no geothermal potential.

Hydropower

Hydropower within the WSA is related to potential sites along the Green River, on the eastern boundary of the WSA. At one time (1979), a potential damsite site had been identified just east of the WSA. A more recent compilation (SAI, 1982) did not identify this site. Instead, it showed a potential site 20 miles downstream. Both of the sites could impound water into the WSA. The 1979 site bordering the WSA has a potential capacity of 165 megawatts. On this basis the WSA's hydropower was given a high rating. The low certainty level reflects the obvious differences in locations among the various studies and indicates uncertainty that the resource would actually be developed at the site east of the WSA. No plans currently exist to construct hydroelectric projects at either of these sites.

LOCATABLE MINERALS

There are 21 post-FLPMA mining claims covering approximately 2 percent of the WSA (360 acres). None of these claims have been patented nor do they appear current in their assessment work. Restrictions exist on the location of mining claims in the power site reserves along the Green River. These restrictions cover the WSA, with the exception of the western portion of Keg Springs and Horseshoe Canyons. This area is open for location, providing the claimant makes an application under the Mining Claim Restoration Act of 1955.

Uranium and Associated Minerals

There is little recorded production of uranium from the WSA. Three mine locations exist along Bowknot Bend. Information on these operations is limited. Only one of the three mines, the Aileen, has record of production. Operation occurred some time in the 1950s, and less than 100 tons of uranium ore were recovered. Evidence of the operations include a cable and ore bucket that crosses the river and was used as a means of access to the mine site. Also, several portals and machinery are located along the old road cuts on the talus slope.

There are several ore deposits (uranium/vanadium) in the vicinity of the WSA, including those across the Green River in Grand County. These deposits are generally small and scattered. They occur in the Chinle Formation and are comprised of the Shinarump, Monitor Butte, Mossback and Church Rock Members. Ore is primarily found in the Mossback Member as tabular deposits in channel sands and as lenticular deposits in the Monitor Butte Member.

Other minerals locally associated with the uranium/

vanadium may include copper, lead, zinc, cobalt, chromium, nickel, molybdenum, strontium, and silver. None of these minerals are predicted to occur in sufficient grades or quantities within the WSA to be minable.

The southern uranium belt, which extends through the WSA, is most favorable for the occurrence of ore deposits. Moderate- and large-size ore bodies are found in the southern belt, which roughly parallels the Muddy and Dirty Devil Rivers (Hawley et al., 1968). The Inter River Mining area within the greater Green River mining district is located to the east of the WSA. Some of the uranium deposits in this area are moderately large (between 100 and 1,000 tons of uranium oxide) and all occur in the Mossback Member of the Chinle Formation The Mossback Member pinches out a short distance northeast of the WSA. Because the WSA is within the southern belt and near the Mossback deposition, the SAI rating for uranium was moderate, and the WSA is assumed to contain 500 to 1,000 tons of uranium. Based on the numerous uranium occurrences near the WSA, it was given a moderate certainty rating.

The Chinle Formation outcrops on the eastern side of the WSA and the overburden increases to the west. All surface deposits probably have been discovered. Further discoveries of subsurface deposits would require drilling. With increasing thickness of overburden, recovery costs would rise. Access to the outcrops is easiest from across the Green River and any other routes would require road building in rugged terrain.

Manganese

Manganese deposits near the WSA are chiefly small and low grade and occur in the Morrison and Summerville Formations. The nearest known deposit to the WSA occurs about 13 miles northwest. The chief host rocks for manganese have been eroded from the WSA. The less favorable Chinle Formation crops out within the WSA and, on this basis, the low SAI rating was assigned. Even though the f2 rating indicates a deposit size to 100,000 tons of 40-percent manganese, this particular WSA is favorable for only very small accumulations—an estimated 2 tons at the most (SAI, 1982).

Copper

Copper in southeastern Utah usually is associated with uranium deposits, both in the San Rafael Swell and mines to the southeast. The SAI rating for copper in the WSA is low. There is uncertainty (according to available data) whether copper deposits exist in the WSA. Deposits, however, would probably be small (less than 50,000 tons). Any copper in the WSA might be found in association with uranium deposits, where it is often considered a waste product rather than part of the ore. It is unlikely any copper within the WSA would be developed, unless as a byproduct of uranium.

Gypsum

There are no known gypsum occurrences reported within the Horseshoe Canyon (North) WSA. The nearest known outcropping is in the Carmel Formation on the east side of the San Rafael Swell (60 miles east of the WSA). The Carmel Formation in the WSA occurs in the southwestern portion. Based on the amount of outcropping and according to available literature, it is uncertain as to the potential of gypsum occurrences in the WSA. Deposits, however, would probably be small (less than 5 million tons). Transportation costs for shipping the gypsum to the market probably would make development of the resource uneconomical.

SALABLE MINERALS

Salable minerals are not known to exist in the WSA.

Wildlife

The Horseshoe Canyon (North) WSA provides habitat for a limited variety of wildlife species. The Green River provides an excellent permanent water source. The WSA also has a semi-permanent water source in Barrier Creek of Horseshoe Canyon and several springs in Keg Spring Canyon from which wildlife can obtain water. Vegetation (forage and cover) is a limiting factor due to low densities, limited species composition, and a high proportion of ground covered by slickrock.

The WSA provides habitat for a low density population of big game species. Some mule deer (approximately 15 animals) frequent the canyon and river bottoms. The entire WSA is encompassed by the Utah Division of Wildlife Resources (UWDR) Deer Herd Unit 29 and is in designated yearlong deer range. The closest major population of desert bighorn sheep is found in the Glen Canyon National Recreational Area (NRA) and Canyonlands National Park region which is within 2 miles south of the WSA. Prior to domestic grazing in and around the WSA, it was thought that desert bighorn sheep occurred in larger numbers. The sheep have been seen across the Green River and may frequent the WSA. BLM and UDWR have not identified any crucial-critical

habitat for desert bighorn sheep in the WSA. Pronghorn antelope are found northeast and within the WSA. The entire WSA is within UDWR Antelope Herd Unit 9 and is yearlong antelope range.

Beaver are found in the Green River and have used Barrier Creek and its cottonwood vegetation. The WSA also provides habitat for coyotes, bobcats, cottontail rabbits, blacktail jackrabbits, woodrats, ring-tails, badgers, Ord kangaroo rats, gray foxes, kit foxes, white-tail antelope ground squirrels, chipmunks, rock squirrels, bats, raccoons, red foxes, weasels, striped skunks, mice, and voles.

Habitat for various small bird species is found within the WSA. The species diversity and populations are small due to the lack of diverse habitat. Both Keg Spring Canyon and Horseshoe Canyon provide nesting, roosting, and foraging opportunities for avian fauna. Few individual raptors are found in the WSA. Of those present, golden eagles, prairie falcons, American kestrels, red-tailed hawks, ferruginous hawks, and roughlegged hawks are the most common. Waterfowl and shore birds would be found along the Green River and occasionally up Keg Spring and Horseshoe Canyons. Mourning doves frequent the WSA.

Several species of snakes and lizards could be found in the WSA. The side-blotched lizard, collared lizard, leopard lizard, short-horned lizard, sagebrush lizard, Western fence lizard, and common tree lizard are the most dominant types. Great Basin gopher snakes, striped whipsnakes, and Western rattlesnakes account for the most common snakes. Woodhouse's toad and Great Plains toad are representative of the amphibians.

The Green River, bordering the WSA, provides habitat for channel catfish, black bullhead, yellow bullhead, carp, speckled dace, flathead minnow, flannel-mouth sucker, bluehead or green sucker, humpback or razorback sucker, and red shiner. Tadpole shrimp may occur in annual ephemeral water pondings in the WSA, although this has not been verified.

The Colorado squawfish is an endangered species identified by UDWR and the Fish and Wildlife Service (FWS) as occurring in the Green River bordering the WSA. The bony-tail chub and humpback chub (also endangered species) may occur, but only as migrators (displaced).

Other endangered wildlife species possibly frequenting the WSA are the peregrine falcon and bald eagle. No sightings of these have been verified; however, the majority of the WSA (19,462 acres) is potential peregrine falcon habitat, and the Green River corridor of the WSA is bald eagle habitat (6,401 acres). A peregrine falcon reintroduction in the WSA is planned for 1985.

The FWS indicates that the WSA may be potential habitat for the endangered black-footed ferret and for three candidate species: ferruginous hawk, razorback sucker, and white-faced ibis (refer to Appendix 4).

There are no wildlife management facilities or proposed habitat treatment projects in the WSA.

Forest Resources

Pinyon-juniper is found in sparse quantity within the WSA (less than 100 acres) and is, therefore, not listed as a vegetation type. While this community is used commercially throughout the Southwest for firewood, fenceposts, and Christmas trees, opportunities for harvest in the WSA are poor. Because of remoteness from populated areas and availability of the products closer to population centers, BLM does not allow any of these uses in the WSA.

Livestock and Wild Horses/Burros

The Horseshoe Canyon (North) WSA contains a portion of one grazing allotment. Livestock grazing use data are shown in Table 9.

TABLE 9
Livestock Grazing Use Data

	Horseshoe Canyon Allotment
Class of Livestock	Cattle
Number of Operators	1
Season of Use	11/01 to 04/15
Total AUMs in Allotment	4,169[1]
AUMs in WSA	959
Total Acres in Allotment	87,640[1]
WSA Acres	20,500
Percent of Allotment in WSA	23

Source: USDI, BLM, 1979a.

[1]These are totals for the allotment on Federal lands.

Range development projects in the WSA are limited to three spring developments, one pipeline, and three livestock trails. The water developments currently are not in use. The possibility

of improving these developments and expanding water use exists. No vegetation treatment projects are proposed in the WSA.

A small herd of wild burros, probably less than 10 in number, is known to frequent the WSA.

Visual Resources

The Horseshoe Canyon WSA consists of several incised drainages and major canyons, gently rolling terrain, large rounded knobs of arch-forming sandstone, alcoves and caves, and intermixed pink, sandy flats.

Elevations range from a high of 5,000 feet at the top of Two Mile Canyon, just north of Horseshoe Canyon, to about 4,000 feet along the Green River bank at the southeastern corner of the WSA.

The western edge of the WSA consists of gently rolling terrain to large rounded knobs of arch-forming sandstone, intermixed with dunes of fine pinkish flats. From most viewpoints this landscape would be classified "panoramic" because there is little impression of visual boundaries and distant views are seldom blocked by objects or landforms in the foreground. From within the canyons the landscape would be classified "enclosed" because visual boundaries and distant views are blocked by landforms in the foreground.

A visual resource inventory was completed in 1977 (refer to Appendix 7 for a description of BLM's VRM rating system). The WSA is classified as having Class A scenery (20,500 acres), which is characteristic of the physiographic region. The sensitivity level has been rated high within the Green River corridor of the WSA. The high level is based on the potential of a Wild and Scenic River designation, high recreation use volume, association of visitor use with scenic values, and the trail and river use volume criteria. The remainder of the area is considered low in sensitivity due to fewer people using and viewing the area. Based on these factors the entire WSA is within the VRM Class II management area.

Cultural Resources

No cultural inventory has been made of the area, and no cultural sites within the WSA have been formally recorded. However, BLM personnel have noted the presence of two or three prehistoric sites thought to be from the Anasazi culture. No National Register sites, existing or proposed, are known to occur in the WSA. The WSA is adjacent to the detached Horseshoe Canyon Unit of Canyonlands National Park which encompasses the well known Barrier Canyon pictographs, a unique archaeologic site. Because significant sites are located near the WSA, the potential for finding significant sites in the WSA is considered high.

Along the Green River and within the WSA, several signatures of early-day river users and trappers can be seen. Writings from these early-day river explorers can be found at the Post Office, a rock atop the saddle of Bowknot Bend, and on several other rock faces along the river.

Recreation

The majority of recreational use occurs along the Labyrinth Canyon/Green River portion of the WSA, as well as the tributary canyons draining into Labyrinth Canyon.

The main recreational activities known to occur in the WSA are hiking, backpacking, camping, and cultural exploration. The Green River borders the WSA and provides several river activities, such as floatboating and the Annual Friendship Cruise. These activities have a significant influence on the recreational use within the WSA. Many of the river floaters use the area for hiking and camping. During the 1982 river floating season, approximately 1,000 visitors signed a volunteer register sheet, identifying their use of Labyrinth Canyon. A 1982 use analysis indicated that register data represent only 10 percent of the actual use of the Labyrinth Canyon river segment from Green River, Utah, to Mineral Bottom. Several campsites and points-of-interest spots have been established within the WSA by these users. It is estimated, based on yearly trend analysis, that the WSA receives about 1,500 visitor days of use by river floating recreationists. This portion of the Green River has been included on the final National Rivers survey list for rivers to be included for Wild and Scenic nominations.

Since the Green River is an inventory-listed segment, BLM must, as part of its environmental review process, avoid or mitigate adverse impacts to the river and consult with NPS before taking any action that could foreclose wild, scenic, or recreational river status (Council on Environmental Quality, 1980).

Another source of recreational participation comes from those recreationists utilizing Canyonlands National Park. In 1982, NPS estimated 1,200 people visited the detached Horseshoe Canyon Unit of Canyonlands National Park. Of those, approximately 40 percent hiked or horsebacked to the northeastern section of the park and possibly

into the WSA. It is estimated that the WSA receives about 480 visitor days of use by National Park recreationists and an additional 150 visitor days of use by other recreationists. Large deep pools of water filled year-round enhance the hiking and camping in this area. The majority of the detached Horseshoe Canyon Unit of the Park has been proposed by NPS as a wilderness area and attracts recreational wilderness-type users to the WSA.

Limited ORV use occurs atop the mesa in the west-central portion of the WSA. Two ways (1.25 miles in length) traverse across the rolling sand and slickrock terrain and are kept evident only by occasional use. The area is remote and difficult to reach even with four-wheel drive vehicles. Use statistics are not available for this recreation activity; however, it is believed that less than 10 visitor days of use occur by ORV recreationists due to distance and difficulty in reaching the WSA. Other similar areas outside or adjacent to the WSA are available for this type of use. According to the San Rafael MFP, the ORV designation for the entire 20,500-acre WSA is currently open in accordance with 43 CFR 8340; however, the restrictive terrain generally makes ORV use impossible over most of the WSA.

No commercial recreational permits have been issued solely for the WSA. Visitor days related to commercial river outfitting solely for the WSA are not known but are expected to be low.

There are no recreational facilities within the unit. Several primitive camping areas exist in the WSA along the Green River and are used heavily by floatboaters. Foot trails leading up tributary canyons and to sites of visitor interest also have been established, primarily by repeated use. Some wild game trails within the major drainages have been used by hikers.

The Horseshoe Canyon (North) WSA has a very high potential for various outstanding recreational opportunities. Green River floatboating has increased three-fold since 1980 as more and more recreationists are discovering the beauty and solitude of Labyrinth Canyon. The many side canyons of Labyrinth add to the adventure of the trip and are being explored by river recreationists. Hiking trails are becoming established along the river and extend into the major canyon drainages of the WSA.

Backpacking opportunities are excellent due to: (1) the large size of the WSA; (2) the presence of adjacent potential wilderness in the upper end of Horseshoe Canyon; (3) a variety of hiking routes (approximately 60 miles total) over terrain with various levels of difficulty; and (4) a variety of interesting special features to explore and discover. An extended hiking trip from Hans Flat down the canyon system to the Green River would cover over 35 miles plus side trips. Day-hiking opportunities are somewhat limited by restricted access.

Camping opportunities are excellent due to the presence of many suitable sites, particularly under large rock overhangs in the canyon walls and in the grassy parks between canyon drainages.

Opportunities for archaeological sightseeing are excellent due to the many sites in the area. The area is historically associated with Butch Cassidy and the Wild Bunch.

The various rock formations, erosional features, caves, vegetation, and narrow canyons all contribute to above-average opportunities for photography and geological and scenic sightseeing.

The total recreational use of the WSA currently is estimated at 2,140 visitor days annually. Approximately 99.5 percent (2,130 visitor days) of the use is attributed to primitive types of recreational activities. Approximately 0.5 percent (10 visitor days) is attributed to use solely for ORV play activities. These use figures represent a substantial increase in recreational use in the area over the past 5 years. BLM estimates that the increase in the past 5 years could be as much as 300 percent.

Wilderness Values

SIZE

The WSA is 20,500 acres in size. It is roughly 12 miles northeast to southwest, and 8 miles wide east to west. The WSA is adjacent to the detached Horseshoe Canyon Unit of Canyonlands National Park, the majority of which has been proposed by the NPS as a wilderness area.

NATURALNESS

The major imprints surrounding the Horseshoe Canyon (North) WSA have been eliminated by boundary adjustments during the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980). What remains of note are the primitive campgrounds and trails adjacent to the Green River, two seldom-traveled ways, three short livestock trails, three developed springs, one water pipeline, a mining trail, portals, tunnels, and several pieces of equipment. These imprints generally are pre-FLPMA in date.

The two ways are located in the central portion of the WSA, along the southwest border. The ways

extend approximately 0.75 mile and 0.50 mile inside the WSA, along two mesa tops of slickrock and sandy flats. The ways were created by blading in the 1960s. Presently, they are being kept evident by periodic vehicular travel. In the summer of 1982, oil and gas exploration was conducted along the second way (0.50 mile) and reclaimed under *Interim Management Policy* (USDI, BLM, 1979b) constraints.

The three short livestock trails (each approximately 0.25 mile long) and a water pipeline are located in the southern portion of Keg Spring Canyon. The pipeline was used to transfer water from a spring to a water tank above the canyon. The tank and pipeline are no longer in use. The trails are used periodically by livestock.

Along the eastern edge of Bowknot Bend is evidence of mining exploration of the 1950s. From the Green River bottom an old road cut with steep switchbacks, several portals with tailing piles below, and some mining equipment are visible. An abandoned cable and ferry extend across the river on the north side of the bend and were once used as a means for access to the mining operation. Natural processes are slowly reclaiming the road cuts. These imprints are localized and do not detract from the WSA's natural character. Therefore, although these imprints combined cover approximately 410 acres of the WSA, the naturalness criterion for areas under wilderness review are met for the entire 20,500-acre WSA. Approximately 2,400 acres could be considered untouched in character and include the relic plant communities occurring on isolated parcels within the WSA on the mesa tops at Bowknot Bend and Horseshoe Bend. The remaining acreage, including the 410 acres with imprints (18,100 acres total) also could be considered natural.

SOLITUDE

The WSA offers outstanding opportunities for solitude. The three major canyon systems, plus the portion of Labyrinth Canyon within the WSA, offer opportunities for users to experience seclusion and isolation. The canyon's meanders, thick canyon bottom vegetation, and 150- to 1,000-foot cliffs effectively shroud lines of sight and suppress sounds for any substantial distance within these canyons. Offsite intrusions and influences are essentially nonexistent within the canyons.

The higher reaches of the WSA, above the canyon drainages, are open and provide great vantage points of the spectacular desert canyon system to the northeast, east, and southeast. Here the vegetation cover is limited and does not effectively screen visitors. The rolling terrain and topographic character of petrified dunes, however, do allow for intermittent separation and seclusion. With an expansive view of the natural surroundings, a user can experience a feeling of remoteness. This is intensified because the WSA is located in a remote portion of the State. Man-made intrusions and sounds are essentially unnoticeable in many locations in the region outside of the Horseshoe Canyon (North) WSA.

The entire WSA (20,500 acres) contains opportunities for solitude that meet the outstanding criterion for areas under wilderness review.

PRIMITIVE AND UNCONFINED RECREATION

The Green River corridor, Keg Spring Canyon, Two Mile Canyon, and Horseshoe Canyon currently are being enjoyed by river floaters and hikers for their primitive recreation opportunities. River users have established primitive hiking trails and camps within the WSA. Hikers from Canyonlands National Park explore Horseshoe Canyon and sometimes extend their trip into the WSA. Horseshoe Canyon and Keg Spring Canyon have intermittent running water, pools, pour-offs, and springs throughout their drainage, making them very attractive during the warmer months.

Hiking, backpacking, camping, and cultural exploration are the outstanding recreational uses of these canyons. Dramatic sheer red-walled cliffs, pinnacles, knobs, isolated tracts of land, two arches, hanging gardens, and historic remnants within the WSA all contribute to a high quality recreational experience.

In addition to the outstanding activities already mentioned, the striking scenery makes sightseeing, photography, and artistic endeavors of high quality. The occasional observation of wildlife attracted to the water in the area also supplements the user's outdoor experience. These qualities combined allow the WSA (20,500 acres) to meet the outstanding primitive recreation criterion set for areas under wilderness review.

SPECIAL FEATURES

The Horseshoe Canyon (North) WSA offers supplemental features of geologic, scenic, historic, wildlife, and ecologic values. These features enhance the other opportunities available within the unit.

The canyons of this unit offer many exposed geologic strata and formations, including cliffs, knolls, alcoves, caves, and arches. The upper reaches provide dramatic views of the twisted and carved character of the area. Bowknot Bend is a perfect example of the present creation of a rincon. The Green River has carved a large deeply entrenched meander, leaving only a narrow neck to be eroded away before its course takes a

shortcut. A completed rincon can be found nearby at the mouth of Horseshoe Canyon.

Historically, the WSA possesses a variety of interest. Adjacent to the southwestern border and an extension of the Horseshoe Canyon drainage, are noteable pictographs in the detached Horseshoe Canyon Unit of Canyonlands National Park.

Within the Labyrinth Canyon drainage and WSA, along the Green River, is evidence of the early river explorers. A river register at Bowknot Bend records the passage of both famous and unknown river runners. Several other rock carvings can be found in the WSA along the river course, adding a distinctly historic flavor to any recreational trip.

Riparian vegetation along the Green River and within the major canyon drainages provides some diversity of habitat for many species of waterfowl, reptiles, and mammals. Habitat diversity and riparian vegetation of the WSA are emphasized by the arid character of the surrounding region. Several isolated tracts of land in the WSA provide a unique relic vegetation habitat. These areas are inaccessible and remain undisturbed by grazing or browsing animals.

Land Use Plans and Controls

No rights-of-way or private lands are located within or adjacent to the WSA.

Physical and legal access to the WSA is provided by the Green River waterway, BLM-maintained roads to Keg Knoll and Keg Springs, as well as trails from Canyonlands National Park.

One State of Utah-owned section of land and three small segments of two other sections (800 total acres) are located within the WSA. All are currently under lease for livestock grazing and minerals to maximize economic returns from State school lands according to State management philosophy.

The river bed to high-water line marks the State of Utah ownership of the Green River. The eastern boundary of the WSA follows this State land in the eastern portion of the WSA for approximately 23 river miles. The State Division of Water Resources responds to development proposals on a case-by-case basis. No developments are proposed by either the State of Utah or private industry for this portion of the Green River.

The southwest boundary of the WSA borders the northeastern boundary of the detached Horseshoe Canyon Unit of Canyonlands National Park. This particular area, the majority of which is being considered for wilderness status, was added to the Park on November 12, 1972, with PL 92-154.

The WSA is identified for multiple-use management by BLM. The majority of the WSA is managed by the BLM San Rafael Resource Area under the San Rafael MFP (USDI, BLM, 1979a). The BLM Henry Mountain Resource Area manages 1,920 acres of the WSA under the Henry Mountain Planning Area MFP (USDI, BLM, 1982c). The Henry Mountain MFP has been reviewed by the Governor of Utah and found to be consistent with State plans.

There is a power site reservation in a portion of the WSA along the Green River. This reservation encompasses the majority of the WSA. Although there are no plans to utilize this reservation in the foreseeable future, the potential may exist for the long term (refer to discussions on hydroelectric power).

About 18,580 acres of the WSA are located in Emery County. The *Zoning Resolution of Emery County* (Emery County Board of Commissioners, 1984) classified the WSA as potential future mining and grazing land.

Some 1,920 acres of the WSA are located in Wayne County. The *Final Report, Wayne County Master Planning Project* (Call Engineering, Inc., 1976) does not identify recommendations at specific locations. The plan recognizes that " . . . . outstanding natural landmarks should be preserved as much as possible." However, it also states that " . . . open spaces should be used for many purposes rather than strictly as wilderness area."

Socioeconomics

DEMOGRAPHICS

Wilderness designation or nondesignation would mostly affect Emery County. Because the WSA includes only a small portion of Wayne County, it is not discussed here in detail. Green River (40 road miles northwest) and Hanksville (55 road miles southwest) are the two closest communities.

Hanksville and the surrounding area had a 1980 population of 351 and is the only community located in northeastern Wayne County. Although it is relatively close to the WSA no ready access is available. Hanksville has services that include several gas stations a general store, a motel, and a restaurant.

Emery County had a 1982 population of 12,900 (University of Utah, Bureau of Economic and Business Research, 1982). Most of the population is concentrated in a series of small communities in Castle Valley, which extends through the northwestern part of the county. There are two

service centers in the northwestern part of Emery County: Castle Dale, the county seat (1980 population of 1,910) and Huntington (1980 population of 2,316) (U.S. Department of Commerce [USDC], Bureau of the Census, 1981). The Town of Green River is located in the eastern part of the county and had a 1980 population of 1,282.

EMPLOYMENT

Recent statistics (refer to Table 10) indicate that about 40 percent of the employment and almost half of the income earned in Emery County is from mining, mostly for coal. Construction and operation of public utilities associated with Utah Power and Light Company's Huntington and Hunter powerplants are Emery County's next most important sources of employment and income. Agriculture accounts for less than 1 percent of the county income and less than 1 percent of total employment.

TABLE 10
1981 Personal Income and Employment
Emery County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	Less than 1	Less than 1
Total Agriculture	Less than 1	Less than 1
Mining	48	39
Construction	23	17
Manufacturing	Less than 1	Less than 1
Transportation and Public Utilities	15	13
Wholesale Trade	1	1
Retail Trade	2	6
Finance, Insurance and Real Estate	1	1
Services	2	6
Other	-	-
Total Private Industry	93	85
Federal Government	1	3
State and Local Government	6	12
Total Government	7	15
Total Nonagricultural	100	100
Unemployment (1st Quarter, 1983)		9.3
	(Dollars)	(Jobs)
Total Employment and Earnings	$128,985,000	6,165
Total Personal Income	$ 97,563,000	

Sources: USDC, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1981 and 1983.

Note: Because of rounding, numbers are not additive. Employment figures include wage and salary employment. The relative importance of farm employment is, therefore, underrated.

During 1970-1980, Emery County experienced a large percentage change in population, increasing from 5,137 to 11,451 or 109.7 percent. This increase was caused by construction of the powerplants mentioned above and related support activities, such as coal mining. The local economy is most affected by changes in the coal market and has seen periods of boom and bust at various times during the county's history.

Unlike the rest of Emery County, Green River has not grown in the past 30 years. Major employment includes mining, government, agriculture, and tourism. Recent uranium mine layoffs have significantly increased unemployment in the area. Because the community's population has remained stable over the past 30 years, its infrastructure has required only minor adjustments, and problems associated with population growth have not occurred.

INCOME AND REVENUES

Past activities in the WSA that could be of any local economic consequence include mineral activities, livestock production, and dispersed nonmotorized recreation.

No oil and gas or mineral production occurs in the WSA. Therefore, mineral and energy resource production from the WSA has not contributed to local employment or income. Table 11 summarizes local income and Federal revenues from the WSA. Appendix 9 identifies the multipliers used to estimate income and revenues.

TABLE 11
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	$49,620
Mining Claim Assessment	Less than $2,100[2]	None
Mineral Production	None	None
Livestock Grazing	$19,180	$1,343
Recreational Use	Less than $8,774	No commercial permits
Total	Less than $30,054	Up to $50,963

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total income that would be generated by these expenditures.
[2]Of the 21 claims in the WSA, none appear current in assessment work.

One livestock operator has grazing privileges in the WSA. Based on the consumption of 959 AUMs of forage by cattle, it is estimated that the WSA accounts for $19,180 of livestock sales, including $4,795 of ranchers' returns to labor and investment.

The WSA supports significant private and regular commercial recreation use. Recreation-related expenditures are well distributed among most businesses in the area and would only be significant to commercial outfitters who use the WSA or rent out equipment for the boating use associated with the Green River bordering the WSA. Income to the commercial users is not directly attributable solely to the WSA because the WSA is only one of many features along the river; therefore, this income is not listed here.

The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per recreational visitor day for all types of recreation in Utah are approximately $4.10. The recreational use for the WSA is estimated at about 2,140 visitor days per year. Only a portion of the expenditures for recreational use of the WSA contributes to the local economy of Emery County.

The WSA generates revenues to the Federal Treasury from two sources: grazing fees and mineral leasing. Within the WSA, about 16,540 acres are currently leased for oil and gas. At a leasing rate of up to $3 per acre, this generates about $49,620 annually. Half of this, or about $24,810, is allocated back to the State of Utah. The State then reallocates these revenues to various funds, the majority of which are related to energy development. Based on 959 AUMs of forage consumed by livestock in the WSA and a grazing fee of $1.40, the WSA annually accounts for $1,343 of grazing fee revenues to the Treasury. One half of this is allocated back to the local BLM District for range improvement projects.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for All Alternatives

1. The alternatives would be carried out as noted in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources with wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from: (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable mineral resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development and possibly future hydroelectric development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown but would probably be low due to the unit's rough terrain, development restrictions near the Green River as per the San Rafael MFP, and economic factors. The following analysis is based on the assumption that minerals would be developed sometime in the future and cause the following disturbance: oil and gas, 160 acres; uranium/vanadium, 40 acres; manganese, 20 acres; and potash, 5 acres. If a future hydroelectric project were constructed on the Green River at one of the two identified damsites, about 2,000 to 5,000

acres in the WSA could be disturbed and/or inundated. Although this is unlikely, it is reflected in the analysis so that the full range of tradeoffs can be covered. Therefore, maximum disturbance with this alternative is projected to be 5,225 acres. No vegetation treatments are planned for the WSA. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed as a PSD Class II area. Disturbance of 225 acres from mineral activities would result in only minor increases in fugitive dust emissions. A hydroelectric project would impact air quality only with construction activities. Because no major sources of air pollutant emissions are expected to occur in the vicinity of the WSA, air quality would remain essentially as at present.

GEOLOGY

Impacts to geology would be localized and minor because disturbances associated with potential development activities would involve surface activities (e.g., rock cuts and borrow areas), widely spaced drilling, or hard rock underground mining. Underground actions would not result in significant subsidence due to the nature of the dominating rock formations.

SOILS

It is estimated that up to 225 acres of soil could be disturbed by mineral exploration and development. Assuming that all disturbance would occur in areas with moderate erosion class and that erosion condition would increase one class, soil loss on the 225 acres would increase by 684 cubic yards from 126 to 810 cubic yards/year. Soil loss would decrease as reclamation occurred. The time required for complete reclamation would be comparatively short in riparian areas, but very long in the dry mesa and bench areas. With this alternative, maximum annual soil loss in the WSA would increase by approximately 684 cubic yards (6 percent) over the current annual soil loss of 11,480 to approximately 12,164 cubic yards per year.

VEGETATION

The assumed maximum disturbance of 5,225 acres would not result in a major change in any vegetation type.

Riparian areas are located within the deep canyon drainages and access to these areas is by waterway or foot. Surface disturbance from mineral activities would be unlikely in these areas, but a hydroelectric project would inundate an estimated 40 to 60 percent of the riparian vegetation in the WSA. The probability of significant disturbance to vegetation is low due to rough terrain and economic constraints for development.

The endangered species, *Oenothera megalantha*, is found near the WSA. Before authorizing surface-disturbing activities BLM would conduct site-specific clearances of potentially disturbed areas. If this or any other protected species could be affected, BLM would initiate Section 7 consultation with FWS as required by the Endangered Species Act and BLM policy. BLM would request a biological opinion when appropriate (refer to Appendix 4). Because necessary measures would be taken to protect these plants, it can be reasonably concluded that the viability of populations of threatened, endangered, or sensitive plant species would not be impacted with the No Action Alternative.

WATER RESOURCES

Surface disturbance from mineral and energy exploration and development could impact 225 acres with this alternative, with a soil loss increase of approximately 315 cubic yards per year. Mitigation, such as Category 3 (no surface occupancy) on 5,000 acres for oil and gas leasing, would limit sediment yield in portions of the WSA.

The most significant potential effects on water resources would occur if a potential hydroelectric dam and reservoir were constructed on the Green River at a damsite partly within or downstream from the WSA. An impoundment created by the dam would dramatically alter the character of the stream, both within the area inundated and downstream. Within the impoundment area, the free-flowing river would be changed to flat water and sediment build-up gradually would occur. Up to 5,000 acres in the WSA could be covered with water as the river's silt load settled out, and existing uses in the river canyon would be eliminated. Downstream the river would be regulated (at least partially) which could tend to reduce spring peak flows and stabilize seasonal flow regimens. Water quality might be slightly improved due to less turbidity. Reservoir depths likely would be deep enough to significantly change downstream water temperature.

Assuming the greatest impact scenario, water resource development and soil disturbance could occur on 5,225 acres. However, the probability of this occurring is unlikely in the foreseeable future due to management limitations in current BLM land use plans, current low interest in hydroelectric and mineral development in the WSA, and economic factors. Therefore, with this alternative,

no substantial impacts to water resources are expected in the foreseeable future, but the long-term potential for impacts would remain.

As an alternative use of water resources, the Green River could continue to be used for free-flowing values, as noted in the Wildlife and Recreation sections. This use could be further supported by Wild and Scenic River designation and would have little impact on existing water resource conditions.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Oil and gas categories in the WSA would remain the same (14,860 acres in Category 1, 5,000 acres in Category 3, and 640 acres in Category 4) to protect the watershed and visual qualities of the Green River environment. The wilderness stipulations on post-FLPMA leases would be lifted.

The WSA has low potential for oil and gas occurrences with less than 10 million barrels of in-place oil (of which 3 million could be recovered) and less than 60 billion cubic feet of natural gas in-place (of which 18 billion cubic feet could be recovered). These oil and gas resources could be explored and developed without concern for wilderness values. While potential is considered low, under a worst-case analysis about 160 acres could be disturbed if oil and gas exploration and development were to occur.

Potash

The entire WSA would be open to potash leasing. The likelihood of the area being leased, explored, or developed is remote due to thicker, richer, and more shallow deposits elsewhere. However, if the resource were to be developed it is assumed to result in the surface disturbance of 5 acres.

Hydropower

The potential exists for a 165-megawatt hydroelectric project partially in the WSA. Conflicting data indicate uncertainty of an exact site location, feasibility studies have not been done, and there is no active sponsor at present. Although the probability of dam construction is low, such a project could contribute an increase of about 73 percent of the current hydroelectric output in Utah.

Locatable Minerals

Locatable mineral development could occur within the WSA. The entire WSA would remain open to mining claim location. The potential deposit of up to 1,000 tons of uranium oxide, less than 50,000 tons of copper, and about 2 tons of manganese could be discovered and extracted. Sixty acres of surface disturbance would result if these minerals are developed.

WILDLIFE

With this alternative, wildlife could be adversely affected by up to 225 acres of surface-disturbing activities associated with mineral development. This impact would be considered short term while work was ongoing. Deer, pronghorn antelope, and mobile nongame animals would be dispersed from the disturbed area for the lifetime of these activities. Desert bighorn sheep would avoid the area. Less mobile wildlife would either perish or co-exist with these disturbances at smaller population levels.

About 19,462 acres of potential black-footed ferret habitat, habitat for peregrine falcon, and 6,401 acres for bald eagle would not be protected by wilderness management actions. However, these endangered species would be protected by provisions of the Endangered Species Act and Section 7 consultation with the FWS (refer to Appendix 4). The three candidate species also would be covered by BLM protective policies. There are no wildlife management facilities existing or proposed and no wildlife habitat treatment projects identified.

If a hydroelectric dam and reservoir were constructed on the Green River, significant impacts to the endangered fishes could result. A water resource alternative favoring free-flowing stream uses, such as Wild and Scenic River designation, would not impact these fishes.

FOREST RESOURCES

There is a limited source of pinyon-juniper trees (100 acres) in the WSA. Occasional recreation use (campers and hikers) in the area would result in the harvest of dead-and-down trees. Surface-disturbing activities (225 acres) associated with mineral development would remove an undetermined number of trees. However, because the trees are widely scattered, the number is expected to be low. Therefore, with this alternative no significant harvest or loss of forest resources is anticipated.

LIVESTOCK AND WILD BURROS

Domestic livestock grazing would continue as authorized in the San Rafael Resource Area MFP. The 959 AUMs currently allocated within the one allotment are controlled by one livestock permittee. Since very little use of motorized vehicles is currently being made to manage livestock, few changes in livestock management techniques

would be expected. Use and maintenance of the three water developments and three livestock trails would continue. Additional roads or other facilities could be proposed and developed for livestock in the future without concern for wilderness values. If mineral and energy development in the future were to occur on up to 5,225 acres, loss of up to an estimated 500 AUMs could occur.

The small burro herd (probably less than 10 animals) likely would not be affected by implementation of this alternative.

VISUAL RESOURCES

Scenic values in the area would continue to be managed with VRM Class II guidelines which state that management activities should not visually attract observers' attention and changes should be designed to maintain the natural landscape's shape, size, and color. Most surface-disturbing activities would exceed these objectives, at least until rehabilitation of affected areas was complete (USDI, BLM, 1981).

Scenic values in areas affected by an estimated 225 acres of surface disturbance from minerals could be degraded, and VRM Class II objectives would not be met. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during activity. Class II VRM objectives would probably not be met during the short term and, even after rehabilitation, some permanent localized degradation would be expected. If roads, vehicular ways, and drill pads are located throughout the area, visual quality could be reduced in the WSA as a whole. Scenic conditions in the canyon bottoms would be altered to reservoir conditions if a hydroelectric project were constructed.

CULTURAL RESOURCES

Protection of cultural values would continue as currently provided. There is a potential for up to 5,225 acres of surface disturbance or inundation with this alternative; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance and would mitigate adverse impacts. Inadvertent loss or damage could occur in the disturbed or inundated areas (up to 20 percent of the WSA). The overall effect on cultural resources is unknown. Vandalism could be a problem and would increase in proportion to visitor increase. There are no known potential or existing National Register sites within the WSA.

RECREATION

The entire 20,500 acres would remain open to recreational ORV use as discussed in the BLM land use plans. Currently, only 1.25 miles within the WSA are being used occasionally by ORV recreationists (10 visitor days per year) . The area has limited access due to rough terrain; therefore, ORV use would not change substantially.

Primitive recreation values (hiking, camping, sightseeing, etc.) could be lost or impaired in areas affected by mineral and energy exploration and development. The potential 5,225 acres of surface disturbance would degrade existing naturalness, solitude, and scenic values in localized areas including areas along the Green River, which has been included on the final survey for Wild and Scenic River nomination. If a future hydroelectric project were constructed, river use would be altered to reservoir recreation use.

The future trends in recreational use of the WSA are unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use of the WSA is expected to increase from 2,140 current visitor days per year to 3,189 visitor days at the end of 20 years. Of this amount ORV activity would increase from 10 visitor days per year to 15 visitor days per year.

Commercial river outfitting opportunities would not be affected by implementation of this alternative unless a future hydroelectric project were constructed.

WILDERNESS VALUES

None of the area would be designated wilderness, and management would be according to the San Rafael and Henry Mountain land use plans. A Wilderness Management Plan to monitor the primitive experience in the WSA would not be developed. Nonprimitive recreation activities could be allowed that might reduce the outstanding opportunities for solitude and primitive and unconfined recreation over the entire WSA.

Assumed mineral and energy exploration and development could disturb up to an estimated 5,225 acres. Should this occur within the disturbed area, the outstanding opportunities for solitude and primitive and unconfined recreation would be foregone. Supplemental geological, scenic, historical, wildlife, and ecological values could be damaged as well.

LAND USE PLANS AND CONTROLS

Implementation of this alternative would be con-

sistent with the *Emery and Wayne County Master Plans* which identify the area as multiple use. Designation would be consistent with plans and policies of the State of Utah as well as the affected BLM land use plans.

Nondesignation of the Horseshoe Canyon (North) WSA would not complement the Canyonlands National Park wilderness proposal in the detached Horseshoe Canyon Unit.

SOCIOECONOMICS

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the mineral resources in the WSA were developed it probably would not lead to a significant increase in employment and income for Emery County. The probability of economic development of minerals within the WSA is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials). A portion of the $100 per year assessment fee required for each mining claim would reach the local economy.

There would be no livestock-related economic losses because the existing grazing use (959 AUMs) and ability to maintain, replace, and build new range improvements (none now planned) would remain as at present.

However, if mineral and energy development were to occur in the future, including hydroelectric project construction, loss of up to 500 AUMs could result in loss of up to $10,000 in livestock sales and $1,400 in grazing fees attributed to the WSA.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase by 1,049 visitor days per year over the next 20 years and overall recreation-related expenditures average $4.10 per visitor day (only a portion of which contributes to the local economy) recreation-related expenditures of $13,075 attributable to the WSA likely would not be significant to the local economy since these expenditures would be widely distributed in the region.

Federal and State revenues would not be reduced by this alternative. There are 3,320 acres in the WSA open to oil and gas leases that are currently not leased. If leased they would bring up to $9,960 additional Federal lease fee revenues per year in addition to new royalties from lease production and bonus bids from new leases in Known Geologic Structures (KGSs). Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees ($1,343 per year) would continue.

All Wilderness Alternative (20,500 Acres) (Proposed Action)

As cited in the Description of the Alternatives section the major change that could occur in the 20,500-acre area would be related to its withdrawal from mineral location, closure to new mineral leasing and sale, and closure to future hydroelectric development. The entire area would be placed in leasing Category 4 (closed to leasing). About 1.25 miles of existing vehicular ways in the WSA would be closed to vehicular use except for approval by BLM as noted in the Description of the Alternatives section. The WSA would be managed under VRM Class I.

For the following analysis it is assumed that the existing mining claims would eventually be explored and developed, causing an estimated 60 acres of disturbance within the WSA. It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing would not be allowed. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates for the WSA.)

Because potentially disturbed areas would be smaller than under the No Action Alternative (60 vs. up to 5,225 acres), the impacts from development and surface disturbance on air quality, geology, vegetation, and forest resources would be insignificant as described for the No Action Alternative. Wilderness designation would provide additional protection to these resources. Impacts to other resources are discussed below.

SOILS

Soil resources could benefit from the All Wilderness Alternative because of the reduced likelihood of surface-disturbing activities.

Assuming that all disturbance would occur in areas with moderate erosion class (worst-case analysis) and that erosion condition would increase one class, soil loss on 60 acres would increase from 34 cubic yards/year to 216 cubic yards/year. However, soil loss would decrease as reclamation occurred.

WATER RESOURCES

Impacts to water would interrelate closely to soils.

Where surface disturbance would occur, increased sediment yield could affect surface water quality. Surface disturbance from mineral and energy exploration and development could impact 60 acres with this alternative. However, there would be no significant impacts to water run-off quantity and quality. Development of a dam on Green River near the WSA would not be allowed and, therefore, no changes in the river regime would occur from any activities related to the WSA.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Exploration for and development of a potential resource of up to 10 million barrels of in-place oil and up to 60 billion cubic feet of in-place natural gas (3 million barrels of oil and 18 billion cubic feet of natural gas recoverable) could be foregone with this alternative. There are 26 existing oil and gas leases covering 81 percent of the WSA. Pre-FLPMA leases (covering 76 percent [15,490 acres] of the WSA) could continue to be explored and/or developed, subject to valid existing rights. Post-FLPMA leases (covering 5 percent [1,050 acres] of the WSA) and other leases issued would be subject to wilderness stipulations. No exploration or development of oil or gas is presently occurring within the WSA, although some leases are part of a unit agreement. Leases not held by production would expire and would not be reissued. Oil and gas recovery from the WSA likely would be foregone. Since potential of the area is considered low with only small occurrences and terrain is restrictive and limits access and development, it is not expected that wilderness designation of the Horseshoe Canyon (North) WSA would significantly reduce future oil and gas production in the region.

Potash

The potash-bearing rocks in the WSA are expected to be low grade, thin, and discontinuous. It is assumed that there are 750,000 to 7.5 million tons of recoverable potash that would be foregone because the area could not be leased for potash. However, the likelihood of the area being explored or developed is remote due to thicker, richer, and more accessible deposits elsewhere.

Hydropower

Due to the presence of the Green River, the WSA was evaluated for hydroelectric power. The two possible project sites would remain partially within the designated wilderness area; however, no current plans to use these sites for power generation are known. Potential for future power generation of up to 165 megawatts (73 percent of current hydroelectric output in Utah) would be foregone. This probably would not be significant in the forseeable future. In the long term, the significance would be dependent on the availability of alternative power production opportunities and considerations (including costs and environmental tradeoffs).

Locatable Minerals

There are 21 mining claims covering 360 acres (2 percent) of the WSA. Claims located prior to wilderness designation could continue to be worked in accordance with valid rights existing at the time of wilderness designation, but operations could not cause unnecessary or undue degradation of wilderness values. It is estimated that up to 60 acres could be disturbed due to exploration and development of the locatable mineral resources under mining claims. Claims would be subject to a validity exam, and those not current in assessment or not showing a valid discovery would be declared null and void. None of the claims in the WSA appear to have current assessment.

The uranium/vanadium-bearing strata is known to occur in the WSA; however, undiscovered deposits are probably subsurface, requiring costly drilling for discovery and development. Access to the area is also very difficult and costly. The potential for recovery of 500 to 1,000 tons of uranium oxide would be foregone, and the entire 20,500 acres would be closed to claim location.

Manganese, copper, and gypsum are three other deposits rated by SAI as being very unlikely to occur in the WSA. Copper potential may be 38,000 tons recoverable and manganese about 2 tons. Wilderness designation would prohibit development of these resources.

Overall, wilderness designation would not have significant impacts to locatable minerals because of their relatively low potential for recovery in the WSA and the better opportunities for these locatable minerals elsewhere.

WILDLIFE

Wildlife would benefit from limitations on potential surface-disturbing activities (from 5,225 acres under the No Action Alternative to only 60 acres with wilderness designation). No wildlife management facilities or proposed vegetation treatment projects are planned for the WSA; therefore, none would be foregone.

Wilderness designation would provide increased protection for threatened and endangered species. Potential peregrine falcon habitat (19,462

acres) and bald eagle habitat (6,401 acres) would be protected. In addition, habitat for four endangered species and three candidate species would benefit by the limitations on development associated with wilderness designation.

LIVESTOCK AND WILD BURROS

Present domestic livestock grazing would continue as authorized in the San Rafael Resource Area MFP. The 959 AUMs currently allocated in the WSA would remain available for cattle.

Range developments of three spring developments, one pipeline, and three livestock trails would be maintained as in the past, based on practical necessity and reasonableness. New range developments would be allowed if determined necessary for the purposes of rangeland and/or wilderness protection and the effective management of these resources. New roads or other livestock management facilities for use with the 959 AUMs would be restricted to protect wilderness values.

Since very little use of motorized vehicles is currently taking place to manage livestock, little effect on livestock management practices are expected.

The wild burros in the WSA would benefit because only 60 acres of habitat would be disturbed compared with up to 5,225 acres with the No Action Alternative.

VISUAL RESOURCES

VRM management in the WSA would change from Class II to the more restrictive Class I, which generally allows only natural ecological changes. This would reduce the potential for surface-disturbing activities. Under this alternative, surface disturbance would be limited to about 60 acres, associated with development of valid mining claims. Although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation some permanent localized degradation could be expected. Because potential disturbance is only 60 acres and potential for development of mining claims is low, visual quality would probably not be reduced in the WSA as a whole.

CULTURAL RESOURCES

There is a potential for increased vandalism to cultural resources due to increased recreational use of the WSA. However, surface disturbance protection afforded by wilderness management probably would outweigh potential vandalism problems from increased recreational activity. Lack of vehicle access and rough terrain would tend to discourage vandalism.

RECREATION

The entire 20,500 acres would be closed to recreational ORV use, including about 1.25 miles of ways. These are occasionally used for recreational camping (10 visitor days per year) and would be foregone. However, this would not be a significant loss to ORV users because of the present low volume of use and availability of similar areas in other parts of the region.

If roads for development of valid mining claims are needed, the quality of primitive recreational opportunities would be reduced. Because potential for mineral production is low and wilderness designation would reduce potential for surface disturbance, the quality of the primitive recreational experience likely would be preserved throughout the area.

Commercial river outfitting would benefit primarily by the increased publicity of the WSA as a feature along the river route and by the reduced prospects for damsite availability. Wilderness designation would also have a positive effect on the Green Rivers potential for consideration as a Wild and Scenic River because it would limit surface-disturbing activities that might affect the WSA, such as dam construction.

Primitive recreation values would be enhanced by management goals protecting the opportunities present. By increasing public awareness of the area, designation could result in increased recreation use of the WSA.

As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation could lead to an undetermined increase in primitive recreational use above the baseline rate. Judging from use densities of a number of primitive areas, wilderness and proposed wilderness areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites; it is estimated that following designation use could be as much as 4,100 visitor days per year (USDI, BLM, 1985). This would be 1,960 visitor days (92 percent) over the area's current estimated 2,140 annual visitor days.

It is concluded that primitive recreation type

values would result in an expected increase of 1,970 visitor days per year. The quality of the primitive recreation experience probably would not be negatively affected by the increased use.

WILDERNESS VALUES

Wilderness designation and management would contribute to the preservation of the wilderness values of size, naturalness, and outstanding opportunities for primitive and unconfined recreation found throughout the WSA. The special features in the WSA (i.e., geology, scenic, historical, wildlife, and ecological values) also would be protected and preserved. Although recreation use would increase (refer to Recreation section), use would be managed and no significant effect on solitude and recreational values would be expected.

The 20,500 acres would be closed to ORVs. About 1.25 miles of ways in the WSA would slowly reclaim through natural processes. Some vehicle use associated with grazing or minerals could continue but would not be expected to significantly reduce wilderness values.

Wilderness values, such as naturalness, would benefit from the limitations on surface-disturbing activities (potential disturbance anticipated is 60 acres). Because the potential for mineral production is low and mitigation would be imposed to protect wilderness values, loss of these values under wilderness designation would be less likely than under the No Action Alternative.

LAND USE PLANS AND CONTROLS

Wilderness designation generally would not be consistent with *Emery and Wayne County Master Plans* because oil and gas leasing would be phased out and the area would be closed to mineral location and other developments. However, many resource uses would continue under more restricted conditions. Designation would be consistent with State policy on maximizing economic returns if the 800 acres of State land within the WSA were exchanged for lands outside the WSA. It would also be compatible with the Canyonlands National Park Wilderness proposal for the detached Horseshoe Canyon Unit.

The BLM San Rafael and Henry Mountain MFPs do not provide for wilderness designation. A decision by Congress to designate the WSA as wilderness would be an amendment to these MFPs. Wilderness designation would not be inconsistent with the proposed power site withdrawal because BLM is required to keep the withdrawn lands in Federal ownership. If Congress chooses to designate the WSA as a wilderness it would likely preempt the power site withdrawal.

SOCIOECONOMICS

Overall there would not be significant changes in current trends of population, employment, and local income distribution.

Because of restrictions placed on the use of resources under wilderness designation, there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 11) as well as loss of potential increases in income and Federal revenues that otherwise could occur under the No Action Alternative. The WSA is rated as having a high potential for hydroelectric power, a moderate uranium deposit, a moderate potash deposit, and a low potential for a small oil and gas deposit. The possibility of development is remote in the near future.

Although future mineral production and related employment foregone with designation is not expected to significantly affect local economic growth, impact estimates are speculative as to the presence of mineral resources. Also, future economic and technologic conditions (including hydropower needs) are uncertain. Therefore, wilderness designation would not significantly affect local and regional economic conditions in the foreseeable future.

Present grazing levels would be allowed (959 AUMs), with continued ranchers' income of $19,180 from livestock sales, including $4,795 of ranchers' return from labor and investment. Added restrictions would not prevent the maintenance and replacement of rangeland developments. No new range improvements have been identified; therefore, there would be no increases in ranchers' income foregone.

Increased public awareness of the area resulting from designation could increase primitive recreational use, demand for commercial outfitter services, and possibly the demand for rentals of boating equipment (refer to the Recreation section). Related local expenditures would be small (average of $4.10 per visitor day statewide) and would only be significant to the four commercial outfitters now using the Green River, which flows through the WSA, and to any other outfitters that may begin to use the WSA. Increased primitive use could result in up to $16,810 in expenditures. This would be distributed to local and regional business.

Motorized recreational use of the WSA is very light, with about 10 visitor days per year. The decrease in related local expenditures would be very small and insignificant to both the local economy and individual businesses.

The loss of leasable acreage would cause a loss of Federal and State revenues. The loss of up to 16,540 acres now leased would cause an eventual loss of up to $49,620 per year to the Federal Treasury. The loss of 3,320 acres potentially available for lease would cause a potential loss of $9,960 per year to the Federal Treasury. In each case, the State would have received half of these revenues and none of this money would flow back to the local economy.

It is concluded that the local economic impact of this alternative is considered insignificant in the foreseeable future. It is noted, however, that future economic potentials foregone could be substantial should there be a long-term demand for 165 megawatts of hydroelectric power.

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Lost Spring Canyon WSA

LOST SPRING CANYON WSA
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(UT-060-131B)

INTRODUCTION

General Description of the Area

The Lost Spring Canyon Wilderness Study Area (WSA) lies entirely within Grand County, approximately 10 air miles north of Moab, Utah. During the *BLM Intensive Wilderness Inventory* (USDI, BLM, 1980) this area was referred to as South Lost Spring Canyon; however, South has since been dropped from the title. The 3,880-acre area is bordered on the south and west by Arches National Park. A natural gas pipeline forms a portion of the northern boundary. The unit is approximately 3.5 miles east to west and 2 miles north to south. There is no State, private, or split estate land within the WSA; however, three State sections border the unit. Access to the area is by way of a county road that connects with Interstate Route 70 (I-70) east of the community of Thompson. The topography of the unit consists of two main canyons: Salt Wash running north to south through the southern part of the unit, and Lost Spring Canyon running northeast to southwest into Salt Wash. Elevation ranges from 4,400 feet along the canyon bottoms to 5,142 feet on the mesa top.

The WSA has a semiarid climate characterized by very hot summers and moderately cold winters. Annual temperatures range from 120 degrees Farenheit (F) to 10 degrees F. Average annual precipitation ranges from approximately 5 to 9 inches; approximately 4 inches or less of that falls during the growing season (May to September). Average annual snowfall is 20 inches or less.

This WSA was dropped from wilderness study status by the U S. Secretary of the Interior on December 30, 1982 due to its small size. As a result of a decision of the Eastern District Court of California (Sierra Club vs. Watt, No. Civil 5-83-035 LRK, dated April 18, 1985) it is in WSA status and is analyzed in this Environmental Impact Statement (EIS) in accordance with (1) general land use planning provisions of Section 202 of the Federal Land Policy and Management Act (FLPMA); and (2) BLM guidance that allows for wilderness consideration of areas of less than 5,000 acres if they are adjacent to land with wilderness potential administered by other Federal agencies.

Specific Issues Identified in Scoping

Public opportunity to review and comment on an initial draft analysis of this area occurred in August 1982. Because of the 1982 decision of the U.S. Secretary of the Interior the area was not among those listed in the brochure used for the 1984 EIS scoping meetings (USDI, BLM, 1984a); however, the specific issues and concerns expressed earlier would apply. They are as follows:

1. *Comment:* The 3,880-acre WSA borders the 18,069-acre Devil's Garden wilderness proposal area of Arches National Park. Should this area be managed in cooperation with the Park? Does the unit have sufficient value to be recommended for wilderness status under BLM management?

   Response: Because it is less than 5,000 acres in size, the 3,880-acre WSA would not be a viable independent candidate for wilderness status unless Congress designates the proposed wilderness adjacent to it in Arches National Park. When added together they form a unit of 21,949 acres, which could be increased to as much as 23,520 acres if a potential National Park Service (NPS) addition is also included.

2. *Comment:* The primary issues of relevance are off-road vehicle (ORV) use and management, minerals, and recreation.

   Response: These items are considered in the Recreation and Mineral and Energy Resources sections of this document.

DESCRIPTION OF THE ALTERNATIVES

Alternatives Considered and Eliminated from Detailed Study

No other alternatives, with the exception of those analyzed, have been considered for this WSA.

Transfer of several WSAs, including the Lost Spring Canyon WSA, to NPS administration in adjacent NPS units has been proposed (H.R. 1214,1984). Such a transfer could occur in the future regardless of wilderness status.

Because of the possibility of management transfer from the BLM to the NPS, the EIS could include analysis of both BLM and NPS management with and without wilderness designation of the WSA. However, because BLM could continue to manage the WSA without wilderness designation or could manage the WSA as wilderness in conjunction with a contiguous NPS-administered wilderness and because the outcome of the NPS wilderness proposals and H.R. 1214 are uncertain actions independent of the BLM wilderness review, alternatives for transfer of jurisdiction from BLM to NPS are not analyzed in this EIS. The EIS addresses the basic question of wilderness designation of BLM-administered lands and the resultant environmental impacts. Transfer of jurisdiction is considered by BLM to be a separate matter that would be evaluated on its own merits and could be implemented with or without wilderness designation.

It is noted, that in cases where lands contiguous to a BLM WSA are proposed as wilderness by another Federal agency, the BLM "Wilderness Study Policy" (USDI, BLM, 1982) requires the BLM in its Wilderness Study Report to determine (1) whether the WSA would be a viable independent candidate for designation as wilderness if Congress does not designate the contiguous land; and (2) if the WSA were designated as wilderness, whether the BLM portion could be more effectively managed by the agency administering the contiguous wilderness area.

BLM has determined that the Lost Spring Canyon WSA would not be a viable independent wilderness if adjacent NPS land is not also designated as wilderness. The question of which agency should manage the WSA to achieve overall management effectiveness will be addressed in the Wilderness Study Report. This decision will be based primarily on factors affecting both BLM and NPS jurisdictions (i.e., relative amounts of the total wilderness area administered by each agency, principal public ingress and exit points, agency staffing and workload in the region, and similar non-environmental items). Environmental differences if any, would be due to variations in BLM and NPS mandates and policy (e.g., national parks are closed to hunting while public lands are not) rather than from wilderness designation. These differences would exist with or without wilderness designation, and therefore are not relevant to the analyses of the impacts from wilderness designation.

Alternatives Analyzed

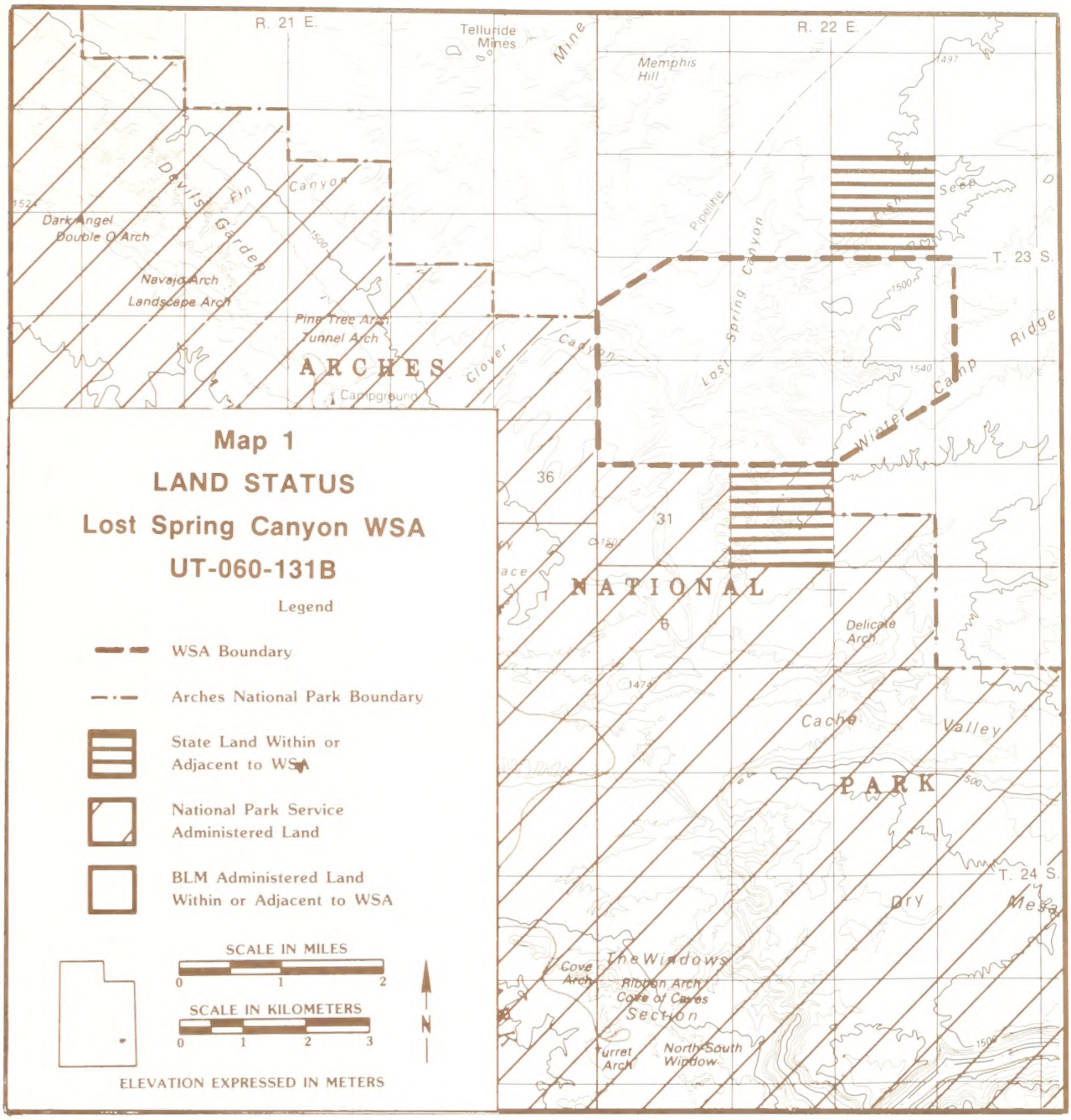
Two alternatives are analyzed for the Lost Spring Canyon WSA: (1) No Action; and (2) All Wilderness (3,880 acres). A description of each alternative follows. Where management intentions have not been clearly identified, assumptions are made based on management projections under each alternative. These assumptions are indicated in each case.

NO ACTION ALTERNATIVE

Under this alternative, none of the 3,880-acre Lost Spring Canyon WSA would be designated by Congress as part of the National Wilderness Preservation System (NWPS). The area would continue to be managed in accordance with the BLM Grand Resource Management Plan (RMP) (USDI, BLM, 1983). No State or private land is located in the WSA (refer to Map 1).

The following are specific actions that would take place under this alternative:

- All 3,880 acres would remain open to mineral location and sale. Development work, extraction, and patenting would be allowed on mining claims. None currently exist. Development would be regulated by unnecessary or undue degradation guidelines (43 Code of Federal Regulations [CFR] 3809) without concern for wilderness values. Existing oil and gas leases covering the entire 3,880 acres of the WSA could be developed. Future leasing would be allowed under Category 1 (standard stipulations).
- The present domestic livestock grazing use in the WSA would continue as authorized in the RMP (419 Animal Unit Months [AUMs]). Use of the existing range trend monitoring transect, including vehicular access, would continue. Use and maintenance of the existing 0.25 mile of pinyon pine fence could also continue; however, at present, there is no wire on the fence posts and the fence is unmaintained. There are no other existing range developments. New range developments could be implemented without wilderness considerations, although none are presently planned.
- Development of improvements for wildlife, water resources, etc. could be allowed if in conformance with the RMP. None are currently planned in the area.


R. 21 E.
R. 22 E.
Telluride Mines
Memphis Hill
Pipeline
Seep
T. 23 S.
Lost Spring Canyon
Ridge
Camp
Dark Angel
Double O Arch
Navajo Arch
Landscape Arch
Pine Tree Arch
Tunnel Arch
ARCHES
Campground
Clover
Canyon
Davis Gulch
Fin
36
31
6
NATIONAL
PARK
Delicate Arch
Cache
Valley
T. 24 S.
Dry
Mesa
The Windows
Cove Arch
Ribbon Arch
Cove of Caves
Section
Turret Arch
North Window
South Window
Map 1
LAND STATUS
Lost Spring Canyon WSA
UT-060-131B
Legend
WSA Boundary
Arches National Park Boundary
State Land Within or Adjacent to WSA
National Park Service Administered Land
BLM Administered Land Within or Adjacent to WSA
SCALE IN MILES
0 1 2
SCALE IN KILOMETERS
0 1 2 3
N
ELEVATION EXPRESSED IN METERS

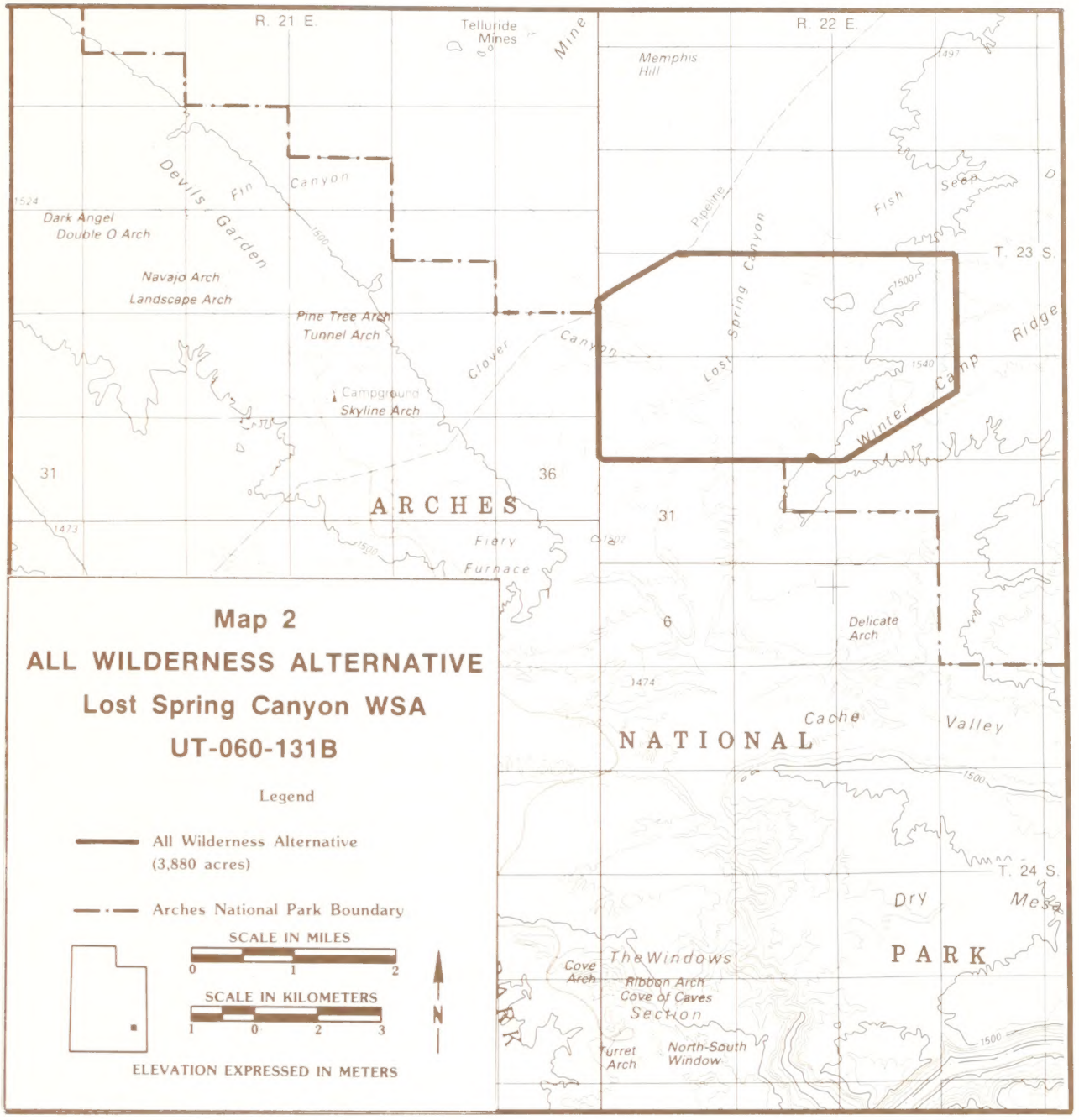
- The entire 3,880 acres would be open to ORV use and new access routes for development would be allowed.
- The entire area would be open to woodland product harvest. There is no harvest of forest products at the present time, nor is any planned.
- The entire area would continue to be managed under Visual Resource Management (VRM) Class II.
- Measures to control fire, insects, noxious weeds, or disease would be taken without concern for protecting wilderness values in instances that threaten human life, property, or high-value resources.
- Activities for the purpose of gathering information would be allowed by permit provided they are carried on in an environmentally sound manner.
- Hunting would be allowed subject to applicable State and Federal laws and regulations.
- Control of predators would be allowed without wilderness considerations to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock. Methods of control would be determined as appropriate.

ALL WILDERNESS ALTERNATIVE (PROPOSED ACTION)

Under the All Wilderness Alternative, all 3,880 acres of the Lost Spring Canyon WSA would be designated by an act of Congress as part of the NWPS (refer to Map 2). Because this WSA lacks the necessary size to constitute a wilderness area by itself, it can only be managed in part with the NPS-proposed wilderness. As a result, the Lost Spring Canyon WSA could be retained by BLM or transferred to the NPS (refer to Map 1), who would then assume management responsibilities. For the purposes of this analysis it is assumed that BLM would retain management of the WSA following designation. It would be managed in part with the contiguous NPS-proposed wilderness in accordance with the BLM "Wilderness Management Policy" (USDI, BLM, 1981b) to preserve its wilderness character. No State lands are located in the WSA. Two State sections adjacent to the WSA would not be acquired by BLM upon designation. However, one State section that would be isolated should both BLM and NPS areas become designated wilderness, may be acquired by the NPS through purchase. The figures and acreages given under this alternative are for Federal lands only. No private or split estate lands are located in the WSA.

The following are specific actions that would be taken under this alternative:

- After wilderness designation, all 3,880 acres would be withdrawn from mineral location and closed to new mineral leasing and sale. Development work, extraction, and patenting would be allowed to continue on that portion of any mining claims that may be located prior to wilderness designation if determined to be valid. Development would be regulated by unnecessary or undue degradation guidelines (43 CFR 3809), with consideration given to wilderness values. Existing oil and gas leases (covering the entire 3,880 acres of the WSA) would be phased out upon expiration unless a find of oil or gas in commercial quantities is shown.
- Present domestic livestock grazing would continue as authorized in the Grand Resource Area RMP. The 419 AUMs in the WSA would remain available to livestock as presently allotted. Use of the range trend monitoring transect could continue, although vehicular access would no longer be allowed. The 0.25 mile of presently unmaintained pinyon pine fence could be maintained in the same manner as in the past based on practical necessity and reasonableness. After designation new rangeland developments would be allowed on a case-by-case basis if necessary for rangeland and/or wilderness resource protection and management. None are currently planned.
- New water resource facilities or watershed activities not related to range or wildlife management would be allowed after designation only if they would enhance wilderness values, correct conditions presenting imminent hazard to life or property, or if authorized by the President pursuant to Section 4(d)(4)(1) of the *Wilderness Act* (Eighty-Eighth Congress of the U.S., 1964). No water resource facilities or treatments are located in the Lost Spring Canyon WSA, and none are currently planned.
- Wildlife transplants or developments would be allowed after designation only if compatible with wilderness values. None are existing or planned in this WSA.
- The entire 3,880-acre area would be closed


R. 21 E.
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North-South Window
Map 2
ALL WILDERNESS ALTERNATIVE
Lost Spring Canyon WSA
UT-060-131B
Legend
All Wilderness Alternative
(3,880 acres)
Arches National Park Boundary
SCALE IN MILES
0 1 2
SCALE IN KILOMETERS
1 0 2 3
N
ELEVATION EXPRESSED IN METERS

to ORV use except for (1) users with valid existing rights if approved by BLM in accordance with 43 CFR provisions; or (2) for occasional and short-term vehicular access approved by BLM for maintenance of approved livestock developments. Vehicular ways (0.25 mile) would not be available for vehicle use except as indicated above.

- A specific Wilderness Management Plan would be developed to govern use and protection of the 3,880-acre wilderness. As part of that plan, it is assumed that a maintenance-and-use border would be allowed along roads adjacent to the wilderness area for purposes of road maintenance, temporary vehicle pull-off, and trailhead parking. This border would be up to 100 feet from the edge of the road travel surface.
- Harvest of forest products would not be allowed except for harvest of pine nuts or noncommercial gathering of dead-and-down wood, if accomplished by other than mechanical means. There is no harvest of forest products at the present time, nor is any specifically planned.
- Visual resources would be managed in accordance with VRM Class I standards, which generally allow for only natural ecological change.
- Measures to control fire, insects, noxious weeds, or disease would be taken in instances that threaten human life, property, or high-value resources on adjacent nonwilderness lands, or where unacceptable change to the wilderness resource would result if the measures were not taken. Measures taken must be those having the least adverse impact to wilderness values (i.e., those that least alter the landscape or disturb the land surface). Therefore, it is assumed that firefighting would be limited to hand and aerial methods.
- Any activity for the purpose of gathering information about natural resources would be allowed by permit provided it is carried on in a manner compatible with the preservation of the wilderness resources. Research and other studies would be conducted without use of motorized equipment or construction of temporary or permanent structures unless no other feasible alternatives exist.
- Nonmotorized hunting would be allowed subject to applicable State and Federal laws and regulations.
- Where control of predators is necessary to protect threatened or endangered wildlife species or on a case-by-case basis to prevent special and serious losses of domestic livestock, it would be accomplished by methods directed at eliminating the offending individuals while at the same time presenting the least possible hazard to other animals or to wilderness visitors. Poison baits or cyanide guns would not be used. Approval of a predator control program would be contingent upon a clear showing that removal of the offending predators would not diminish the wilderness values of the area.

Summary of Environmental Consequences

Table 1 summarizes the main environmental consequences resulting from implementation of the alternatives. Those resources that would be affected significantly or differently by the alternatives are listed in the table to present a comparison of the alternatives.

AFFECTED ENVIRONMENT

Unless otherwise indicated, information for this section was taken from the Grand RMP and other BLM technical reports and documents.

Air Quality

The WSA has a Prevention of Significant Deterioration (PSD) Class II Air Quality Classification as per the 1977 Clean Air Act Amendments. Arches and Canyonlands National Parks are the only nearby Class I areas. Arches National Park is adjacent to the WSA. Prevailing winds are from the west-southwest. The air quality generally meets Class II standards.

Visibility, both within and from the WSA, is an important value. Portions of the WSA can be seen from many high-use areas including the LaSal Mountains, the Colorado River, and Arches National Park. Visual range in this portion of Utah averages between 100 and 132 miles during the summer (Aerocomp, Inc., 1984).

LOST SPRING CANYON WSA
TABLE 1
SUMMARY OF SIGNIFICANT ENVIRONMENTAL CONSEQUENCES
LOST SPRING CANYON WSA

Resource	Alternatives	
	No Action	All Wilderness (3,880 Acres) (Proposed Action)
Soils	Mineral and energy development could result in an increase in soil loss in the WSA up to 2,730 cubic yards, compared with current soil loss of 1,998 cubic yards per year.	Annual soil loss could increase by up to 73 cubic yards.
Mineral and Energy Resources	Although likelihood of development is low, potential recovery could be achieved for up to 3 to 15 million barrels of oil, 18 to 90 billion cubic feet of natural gas, 500 tons of uranium oxide, 50,000 tons of copper, 100,000 tons of manganese, and 75,000 to 7.5 million tons of potash.	Oil, gas and potash likely would not be recovered. Assuming a worst-case analysis, uranium, copper and manganese recovery would also be foregone. Due to the low likelihood of recovery of these mineral resources, however, the loss of development opportunity would not be significant.
Wildlife	About 19 percent of the WSA could be affected by mineral and energy development, which could adversely affect wildlife habitat.	Wildlife would benefit from solitude.
Livestock	Grazing of 419 AUMs and maintenance of existing developments would continue. New developments could be implemented; however, none are now proposed.	Grazing of 419 AUMs and maintenance of existing developments would continue. Little effect on grazing management is expected. New developments proposed in the future might not be allowed.
Visual Resources	The quality of visual resources could be disturbed on up to 750 acres, which could degrade visual resources throughout the WSA.	Visual quality could be disturbed on up to 20 acres, which would probably not degrade visual resources in the unit as a whole.
Recreation	ORV use could continue on 0.25 mile of way. Overall recreational use could increase from the present 750 visitor days per year to 1,118 over the next 20 years. Up to 750 acres of mineral-related disturbance could reduce the quality of primitive recreation.	The WSA, including 0.25 mile of way, would be closed to ORV use. Recreational use could increase by an undetermined amount due to publicity associated with wilderness designation.
Wilderness Values	Wilderness values could be lost on up to 750 acres (19 percent of the WSA). This could reduce wilderness quality throughout the WSA.	Wilderness values would be protected, except on up to 20 acres (0.5 percent of the WSA) which may be affected by development of valid mineral rights.
Land Use Plans and Controls	This alternative would be consistent with the *Grand County Master Plan,* State of Utah plans and policies, and the current BLM Grand RMP. It would conflict with the NPS proposals for nearby wilderness and the transfer of 2,882 acres of the WSA to the adjacent NPS unit.	This alternative would not be consistent with Grand County's concept of multiple use. It would not conflict with State policies, and would complement the NPS proposals for wilderness and transfer of a portion of the WSA to the adjacent NPS unit. Designation would constitute an amendment of the BLM Grand RMP.
Socio-economics	Annual local sales of less than $11,455 and Federal revenues of up to $12,227 would continue.	Annual local sales of less than $11,455 and Federal revenues of up to $587 would continue, but Federal revenues of up to $11,640 from mineral leasing would be foregone. The opportunity for future energy and mineral development and local economic benefits would be reduced in the WSA.

Geology

The Lost Spring Canyon WSA lies within the northwest-trending Paradox fold and fault belt. Rocks at the surface consist almost exclusively of flat-lying beds of the Summerville Formation and Entrada Sandstone of Jurassic age. The axis of the Salt Valley-Cache Creek anticline trends west-northwest a few miles south of the tract, whereas the Yellow Cat dome lies a few miles northeast of the tract. Three northwest-trending normal faults with minor displacements can be traced along the surface for about 5 miles a short distance north of the tract.

The topography of the WSA consists of two main canyons: Salt Wash running north to south through the southern part of the unit, and Lost Spring Canyon running northeast to southwest into Salt Wash. The northern-most portion of the WSA consists of wide, open, sparsely vegetated flats. Elevation ranges from 4,400 feet along the canyon bottoms to 5,142 feet on a small mesa top.

The canyon system contains several 300- to 400-foot deep canyons and side drainages with steep walls of Entrada Sandsone. The canyons are highly eroded with many interesting visual features including at least one natural arch.

Exposed geologic formations include the Summerville, Entrada, and the top portion of the Navajo. Below the surface sedimentary deposits extend to a depth of approximately 22,000 feet where the pre-Cambrian mass of schist, gneiss, and quartz monozonite are encountered. Some of the sedimentary units are favorable formations for uranium or oil and gas deposits.

The unit is located within the Canyonlands Section of the Colorado Plateau Physiographic Province, which can be characterized as a series of plateaus and canyons.

Soils

Soils in the Lost Spring Canyon WSA consist of about 30 percent deep stony soils on steep canyon sides, 20 percent shallow to very deep sandy and loamy soils on mesas, and 15 percent very deep loamy and silty soils on the nearly level canyon floors. Approximately 35 percent of the area contains rock outcrop occurring as slick rock on the edges of mesas and as cliffs and ledges in the canyons.

Table 2 describes soil characteristics and land types and Table 3 describes erosion conditions.

There presently is no agricultural activity within the Lost Spring Canyon WSA. There was an attempt at one time to farm the canyon bottom just 1 mile up Salt Wash (outside of the WSA).

There may be a possibility of agricultural development along Salt Wash and at the mouth of Lost Spring Canyon. Soil here is moderately deep clay loam and is quite alkaline. Also, in the northeast quarter of Section 19, the soil is a sandy loam and could be farmed. Water for irrigation would be a problem here (no surface water) as well as on the wash bottoms previously mentioned (salty surface water and lowered water table because of erosion).

TABLE 2
Soil Characteristics and Land Types

Soil Characteristics and Land Type	Percent of Area	Acres	Estimated Rate of Erosion (cubic yards/acre/year)	
			Present Condition	Bare Soil Surface
Rock Outcrop	35	1,358	0.0	0
Deep stony soils on steep canyon sides	30	1,164	1.0	10
Shallow to very deep sandy and loamy soils on sloping mesas	20	776	1.0	5
Very deep loamy and silty soils on the nearly level canyon floors	15	582	0.1	1
Totals	100	3,880		

Source: Hansen, 1985.

Vegetation

Vegetation within the unit is generally of three major types: desert shrub made up of Great Basin sagebrush and blackbrush totaling approximately 1,920 acres, juniper-pinyon woodland totaling approximately 200 acres, and about 3½ miles of riparian vegetation (200 acres) mixed with about 200 acres of saltbush-greasewood.

The balance of the unit is composed of outcroppings of slickrock sandstone supporting only pockets of vegetation.

Juniper is found primarily in the eastern portion of the unit at higher elevations. Density is sparse with tree heights being in the 8- to 12-foot range. Unique ecological communities have not been identified in the unit to date. However, the WSA may contain two BLM sensitive species (*Lomatium latilobum* and *Zigadenus vaginatus*). Both

Table 3
Erosion Condition

Erosion Class	Erosion Rate (cubic yards/ acre/year)	Annual Soil Loss Under Present Conditions			Annual Soil Loss if Disturbed		
		Percent of Area	Acres	Cubic Yards	Percent of Area	Acres	Cubic Yards
Very High	20.0	0	0	0	0	0	0
High	10.0	0	0	0	30	1,164	11,640
Medium	5.0	0	0	0	20	776	3,880
Low	1.0	50	1,940	1,940	15	582	552
Very Low	0.1	15	582	58	0	0	0
None	0.0	35	1,358	0	35	1,358	0
Totals		100	3,880	[1]1,998[1]	100	3,880	[1]16,102[1]

Source: Hansen, 1985.

[1]Average annual soil loss in cubic yards per acre: 0.51 under present conditions; 4.15 if disturbed.

are Fish and Wildlife Service (FWS) candidate species, although not under active consideration for listing as threatened or endangered species. Table 4 shows the existing vegetation types within the WSA.

TABLE 4
Existing Vegetation Types

Existing Vegetation Type	Acres	Percent of WSA
Sagebrush, blackbrush	1,920	50
Pinyon-juniper woodland	200	5
Riparian	200	5
Saltbush-greasewood	200	5
Barren	1,360	35
Total	3,880	100

Source: USDI, BLM, 1972.

The Lost Spring Canyon WSA lies in the Colorado Plateau Province Ecoregion as shown on the Bailey-Kuchler ecosystems map (USDI, Geological Survey, 1978). The potential natural vegetation (PNV) type of the WSA is juniper-pinyon woodland. PNV is the vegetation that would exist if plant succession were allowed to reach climax without human interference. It does not necessarily reflect the actual vegetation present. PNV is an important object of research because it reveals the biological potential of a site.

Water Resources

There are no water wells or developed springs in the WSA. There are several seeps.

Salt Wash and Lost Spring Canyons are the major drainages in the Lost Spring Canyon WSA. There is an intermittent stream fed by seeps in the lower reaches of Salt Wash below Lost Spring Canyon. Other seep-fed intermittent streams occur in portions of Lost Spring Canyon and Fish Seep Draw near Lost Spring Canyon.

Present water use is mostly by livestock and wildlife. Water quality is not known.

There are no existing or planned watershed treatment areas or water developments within the WSA.

Mineral and Energy Resources

Mineral resources are not known to have been recovered from the WSA, although it is underlain by strata known to be favorable for oil and gas, uranium, and potash deposits. The region of the WSA, the Paradox fold and fault belt, is a significant producer of these mineral resources.

Each WSA was assessed for its energy and mineral resources by Science Applications, Inc. (SAI, 1982). The results are summarized in Table 5. (Refer to Appendix 5 for an explanation of the SAI rating system.)

TABLE 5
Mineral and Energy Resource Rating Summary

Resource	Rating		Estimated Resource
	Favorability[1]	Certainty[2]	
Oil and Gas	f3	c2	10 to 50 million barrels of oil; 60 to 300 billion cubic feet of natural gas
Uranium/ Vanadium	f2	c2	Less than 500 tons of uranium oxide
Coal	f1	c4	None
Geothermal	f1	c3	None
Hydropower	f1	c4	None
Copper	f2	c1	Less than 50,000 tons
Potash	f3	c3	1 to 10 million tons
Manganese	f2	c2	Less than 100,000 tons

Source: SAI, 1982.

[1]Favorability of the WSA's geologic environment for a resource (f1 = lowest, f4 = highest).
[2]Degree of certainty that the resource exists within the WSA (c1 = lowest, c4 = highest).

An overall importance rating (OIR) of 2 was assigned to the Lost Spring Canyon WSA by SAI (1982). The OIR is given on a scale of 1 to 4, where 4 is equated with high mineral importance. The OIR attempts to integrate the individual mineral resource evaluations for a tract with other data, such as gross economics or the proposed location of energy corridors, into a summary number that reflects an overall assessment of the resource importance of the WSA. Although oil, gas, and potash were assigned favorabilities of f3, the OIR was lowered to 2 because of the tract's small size and because it is contiguous with Arches National Park.

If the WSA is recommended as suitable for wilderness, its mineral importance will be reviewed by the USDI, Geological Survey and Bureau of Mines in an independent mineral investigation report. Reports will be made available to the public and will be submitted to the President and Congress as required by FLPMA. BLM and the Secretary of the Interior will also consider these reports prior to making final wilderness recommendations.

The Strategic and Critical Materials Stock Piling Act, as amended, provides that strategic and critical materials be identified and stockpiled in the interest of national defense to prevent a costly and dangerous dependence on foreign sources in time of a national emergency. The Act defines strategic and critical materials as those needed to supply military, industrial, and essential civilian needs during a national emergency but that are not found or produced in the United States in sufficient quantities to meet such a need. The WSA could contain deposits of vanadium, manganese, and copper that are currently listed as strategic and critical materials (Federal Emergency Management Agency, 1983). Although listed as strategic, copper is relatively common. Supplies currently exceed domestic demand.

LEASABLE MINERALS

There are no mineral leases within or adjacent to the WSA, other than for oil and gas. Other leasable minerals produced regionally include potash and coal. However, Cretaceous coal-bearing strata either never were deposited in the vicinity of the WSA or have eroded away.

Oil and Gas

The SAI rating (f3) indicates that potential exists within the tract for 10 to 50 million barrels of oil and 60 to 300 billion cubic feet of gas. Approximately 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas are considered recoverable (Appendix 6 provides recoverability estimates). The certainty level (c2) indicates that some positive data exist within the vicinity of the tract.

SAI has estimated that the Paradox Basin in southeastern Utah and western Colorado contains 1.2 billion barrels of undiscovered recoverable oil and 3.8 trillion cubic feet of undiscovered recoverable gas. Most production occurs from Pennsylvanian-aged rocks, produced from the Paradox Formation in Long Canyon, Shafer Canyon, Kane Creek, and Bartlett Flat, all about 15 miles west and southwest of the WSA, and from Wilson Canyon about 35 miles south. However, favorability of occurrence in the Paradox Formation within the WSA is seen as low, while the favorability for occurrence in Mississippian Formations is seen as at least moderate. The petroleum potential within the WSA is related more to Mississippian than to Pennsylvanian reservoir rocks, because the Paradox Formation (Pennsylvanian) presents thin, discontinuous, interbedded plastic reservoirs, and the Mississippian contains favorable source and reservoir rocks with potentially favorable pre-Pennsylvanian structural features. The Lisbon Valley Field about 40 miles southeast of the WSA, is produced from a Mississippian Formation. Continuing interest in the area is evidenced by recent seismic work in the WSA. Though rugged, the terrain here does not preclude development of oil and gas. Further, the structure is favorable since it is part of an anticline and should be accessible by directional drilling even from points beyond the boundaries.

The entire WSA (3,880 acres) is open to oil and gas leasing (Category 1, standard stipulations) under the BLM category system established in 1975 (USDI, BLM, 1975). The entire WSA is under pre-FLPMA oil and gas lease.

Oil and gas leases issued prior to the passage of FLPMA in October 1976 are referred to as pre-FLPMA leases and are managed differently than those issued after that date. The latter are known as post-FLPMA leases.

Pre-FLPMA leases are governed by stipulations determined at the time of lease application, before wilderness studies were mandated. These stipulations may allow for the impairment of wilderness values, as a prior and existing right associated with lease development.

Post-FLPMA leases in WSAs contain more restrictive stipulations that require exploration and development to be nonimpairing to wilderness values. Post-FLPMA leases generally require restricted access and special reclamation provisions, such as topographic contouring, special seeding, and hydromulching (USDI, BLM, 1981). Because of less restrictive requirements, pre-FLPMA leases may be more economical to explore and develop than post-FLPMA.

Leases producing oil or gas prior to their original expiration date or those that are part of a unitized field would continue. Undeveloped leases would terminate on their expiration dates (usually 10 years from the date of issuance). Wilderness designation would not affect the termination of existing leases.

Potash

Bedded potash is found within the Paradox Formation underlying the Paradox Basin. Sylvite, a potash-bearing mineral, is mined by a solution process about 23 miles southwest of the WSA and is economically important to the Moab community. The potash-bearing zones under the WSA are estimated to be well below 7,000 feet.

The SAI rating for potash (f3) indicates a potential for 1 to 10 million tons of potash within the tract evaluated. Approximately 75,000 to 7.5 million tons of potash are considered recoverable. The certainty level (c3) indicates data showing a potash-bearing formation underlying the WSA and a potash mine nearby.

Currently the potash market is depressed due to cheap foreign supplies. Also, considering the widespread occurrence of this resource throughout the Paradox region, the difficult terrain, and technical problems in solution mining, it is unlikely that new potash development would occur in the WSA.

LOCATABLE MINERALS

The Colorado Plateau contains 50 percent of the nation's total uranium reserves and about 36 percent of potential resources (SAI, 1982). The Colorado Plateau around Moab is very important for uranium and vanadium. Principal uranium-bearing units locally are the Jurassic Morrison Formation, the Triassic Chinle Formation, and the Permian Cutler Formation. The Morrison Formation has been removed by erosion from the WSA. The Chinle is favorable over broad areas of the Colorado Plateau. However, the ancient channel system known to contain uranium-bearing sediments (the Moss Back Member of the Chinle) did not extend northward to the WSA, and only the relatively barren Church Rock Member of the Chinle is contained within the WSA. Also, the WSA is in an area characterized as having less meandering distributary channels in Cutler time than the Lisbon area. As such, the Cutler Formation in the WSA is considered only marginally favorable for uranium. The WSA probably has little if any minable ore. The SAI rating for uranium indicates a low (f2) potential for less than 500 tons of uranium oxide in-place within the WSA. The certainty that uranium occurs in the tract is low (c2) because those units that are marginally favorable (the Cutler and Chinle Formations) are not exposed.

Other minerals produced regionally include copper, manganese, gold, and silver. The WSA is considered geologically unfavorable for these. Localized copper deposits have been mined from the Kayenta but do not appear to be present within the WSA. Localized manganese deposits have been found randomly in Jurassic Morrison and Summerville Formations. The Morrison has been eroded from the tract, and it seems highly unlikely that the Summerville in the WSA could contain more than a few tons of manganese ore. Gold and silver are commonly found in placer deposits along streams, but drainage patterns within the WSA are highly unfavorable for this type of deposition.

There are no mineral claims in the WSA.

Wildlife

The area provides habitat for a variety of wildlife species. Mule deer, coyotes, bobcats, cottontail rabbits, and a variety of reptiles and rodents may be found throughout the WSA. Several species of raptors and songbirds also inhabit the area. Cougar may rarely visit the area.

Due to the lack of precipitation, the nature of the soils, redrock cliffs, and extremely hot summer

temperatures, this area is not capable of supporting a diversity of vegetation sufficient to produce large populations of big game animals. The most common big game present are mule deer, which are found in relatively small numbers. The WSA is located in the Utah Division of Wildlife Resources (UDWR) Deer Management Herd No. 31A. During the heat of the summer many of the deer may leave this area to migrate to the higher elevations of the Dome Plateau. Those that remain through the summer are along the Salt Wash and Lost Spring Canyon drainage where water and cover are more available.

Mourning dove are common in the area during the early spring to early fall period. Desert cottontail rabbit are common unit wide.

Waterfowl are not common in the WSA.

It is possible for the Salt Wash and Lost Spring Canyon streams below the WSA to support limited populations of a variety of nongame fish species such as dace, shiners, and killfish.

There are several species of amphibians, snakes, and lizards present. The most common are horned lizard, leopard lizard, Great Basin sagebrush lizard, whiptail lizard, collared lizard, gopher snake, striped whipsnake, the midget faded rattlesnake, red-spotted toad, canyon tree frog, and Utah tiger salamander.

The most common birds in the WSA are canyon wrens, rock wrens, kestrels, ravens, redtailed hawks, great-horned owls, prairie falcons, and golden eagles. The golden eagle is a BLM sensitive species. No raptor nests have been located in the WSA.

The American peregrine falcon and the black-footed ferret are two endangered species that may occasionally visit the area, although none have been sighted.

There are no existing or potential vegetation treatments for improvement of wildlife habitat. No wildlife transplants are proposed.

There are no crucial or critical habitats in the WSA.

Forest Resources

No forest products have been harvested from the WSA. Forest resources are limited to Utah juniper on approximately 200 acres. The juniper trees are scattered over the sandstone benches, with a low density of approximately 16 trees/acre and a height of 8 to 12 feet.

Livestock and Wild Horses/Burros

The entire Lost Spring Canyon WSA is within the Lost Spring pasture of the Taylor Allotment. This is a winter-spring cattle area. Grazing in the entire pasture is normally 350 cattle from November 5th to March 30th. The rancher usually makes use of the WSA by putting 50 to 100 head of cattle in the area for approximately one month (during the coldest part of the grazing season). The entire allotment contains 8,372 AUMs of livestock range; the WSA is 5 percent of the total allotment and contains approximately 419 AUMs.

There is a range trend monitoring transect and 0.25 mile of unmaintained pinyon post fence within the WSA. There are no other range projects existing or planned within the WSA.

Wild horses or burros are not known to occupy the WSA.

Visual Resources

The area is characterized by deeply eroded side canyons with single vertical spires, fins, rounded domes, and several arches. Colors include the reds, salmons, and buffs of sandstone, varied in hue and intensity from desert varnish, and the varying greens of vegetation. No constant year round flow of water occurs within the WSA boundaries. Identified modifications within the WSA's boundary include a 0.25-mile pinyon post fence, ORV tracks, seismographic lines, cattle paths, and 2 ways totaling 0.25 mile. All modifications are linear in nature and create low contrasts to the color and line elements of the characteristic landscape.

The entire WSA is located in an area that has been evaluated as Class A scenery. This area scored the fourth highest of 10 units evaluated in the Big Flat-Squaw Park East Planning Unit.

The entire WSA is located in a high sensitivity area and is a VRM Class II area. Refer to Appendix 7 for a description of BLM's VRM rating system.

Cultural Resources

Known historic and prehistoric remains represent a portion of the scientific and recreation values of Lost Spring Canyon. Although no complete inventory exists, at least two historic and three prehistoric sites are reported. Known sites include a historic signature and ranching corral, two prehistoric lithic scatters, and a campsite. Lost Spring, just outside the WSA's northern boundary,

has historical interest including an old cabin, hollow log water troughs, and log corrals. Numerous additional sites are found in nearby portions of Arches National Park. No sites listed in or nominated to the National Register of Historic Places are within the WSA, although known sites may have that potential. It is estimated that the WSA may have as many as 12 cultural sites, seven of which could be National Register eligible.

Cultures represented in the region include the Paleo Indian, Desert Archaic, Fremont, Anasazi, Ute, and historic European.

European influence in the region dates from the Dominguez-Escalante Expedition of 1776, followed by Mexican traders of the Old Spanish Trail and French fur trappers in the 1810 to 1840 era. American explorers crossed the region just north and west of the WSA in the 1850s about the time the first Anglo-American settlement was also attempted at Moab. Permanent American settlement occurred in the late 1870s and early 1880s with ranching spreading to the WSA at that time.

Recreation

There are no documented use statistics for Lost Spring Canyon WSA. Lost Spring Canyon provides recreational opportunities for hiking, horse travel, backpacking, photography, sightseeing, ORV use, and some rock climbing. The area offers a diversity of trail opportunities entirely within the WSA and in conjunction with the Arches National Park trail system. There is a growing usage of dirt bikes in the canyons and washes. Although the area is adjacent to Arches National Park, actual recreation use is low (approximately 750 annual visitor days) at this time. Most of the current visitor use (hiking and backpacking) is done in conjunction with use of Arches National Park. Most of the use is primitive in nature. Of the total use, approximately 200 visitor days are attributed to ORV use. Under the Grand RMP, the area is open to ORV use. Access to the area from I-70 is not difficult; however, the maze of roads in the Yellow Cat Mining area creates some directional confusion en route to the unit.

The area has high quality historic and scenic sightseeing values. Historical sites include Lost Spring, just outside the unit's northern boundary. This area includes an old cabin, hollow log water troughs, and log corrals. One access into the Lost Spring drainage is past this historic camp. Scenic views of the WSA from a plateau above the confluence of Lost Spring Canyon and Salt Wash are impressive. The salmon-colored slickrock walls are deeply undercut. Several arches are found within this WSA. Many of the unique geologic features within Arches National Park are also visible in the distance from this viewpoint. It is possible to hike into the Salt Wash drainage from the confluence viewpoint.

Wilderness Values

SIZE

The small size of this unit (3,880 acres) does not qualify it for wilderness status (less than 5,000 acres). However, it is being studied because of its proximity to 18,069 acres of proposed wilderness within Arches National Park. When added together they form a unit of 21,949 acres, which could be increased to as large as 23,520 acres if a potential NPS addition is also included.

NATURALNESS

The area remains relatively free of human imprints and meets the naturalness criteria for wilderness. Several seismograph lines are found on the mesa top in the northern portion of the unit. In addition there are 2 ways totaling 0.25 mile, a 0.25-mile pinyon pine fence, and ORV tracks and cattle paths. All are substantially unnoticeable in the area as a whole.

SOLITUDE

The size of the unit (3,880 acres) does not contribute to the solitude of the area, unless considered with the adjoining NPS proposal for wilderness.

Topographic screening is the strongest single factor influencing solitude in the area. Numerous side drainages to Lost Spring Canyon and Salt Wash have highly eroded relief and block out the sights and sounds of nearby users. Opportunities for solitude within these side drainages are outstanding. Solitude found in the main canyons and mesa flatlands is of lesser quality.

Most vegetation within the WSA is low-growing and therefore does not contribute to a feeling of solitude. Some vegetation screening does exist at the higher elevations and in some wash bottoms due to riparian vegetation.

The WSA is affected somewhat by outside influence, but not to a great degree. At times vehicle traffic within Arches National Park can be heard from the unit. Maintenance activities along the natural gas pipeline, which borders the unit on the north, will occasionally be noticeable from within the WSA.

Opportunities for seclusion are many and varied particularly within the many erosional features

and side drainages of Lost Spring Canyon. Opportunities are present to a lesser degree within Salt Wash. Opportunities are generally absent on the flat mesa tops.

The WSA meets the outstanding opportunities for solitude criterion on 2,910 acres. It does not meet the criterion on the remaining 970 acres.

PRIMITIVE AND UNCONFINED RECREATION

This unit contains outstanding opportunities for primitive and unconfined recreation in approximately 75 percent (2,910 acres) of the unit. The WSA provides opportunities for hiking, horse travel, backpacking, and photography. The area offers a diversity of routes that can be taken wholly within the unit and in combination with trips that include use of the Park. Scenic values contribute greatly to these opportunities. Opportunities for rock climbing and boulder climbing are also present.

SPECIAL FEATURES

The most outstanding feature of this unit is its erosional diversity. Colorful rock formations, which include several natural arches, as well as fins and domes, provide excellent scenery. Some cultural resource values are also present.

Land Use Plans and Controls

Access to the WSA is by way of a county road that connects with I-70 east of the community of Thompson.

Land use is relatively intense in Moab and Spanish Valley, several miles south of the WSA, and in Castle Valley to the north of the WSA.

There are no State or private in-holdings within the WSA. Approximately three State sections (1,760 acres) border the unit on the north, west, and south. Two of the sections (1,120 acres) are within the boundary of Arches National Park. The State Land Board manages the State sections for economic return to the State school system.

The Lost Spring Canyon WSA is contiguous with 18,069 acres in Arches National Park recommended for wilderness by the NPS and an additional 1,571 acres being considered for addition to the NPS's wilderness proposal. In 1984 the House Subcommittee on Public Lands and National Parks conducted a hearing on H.R. 1214, a bill designed to transfer jurisdiction of certain lands, including the Lost Spring Canyon WSA, from the BLM to the NPS.

In response to the hearing, the NPS assessed the WSA to determine its value for potential addition to the adjacent NPS unit and found that a portion of the WSA contains values that would supplement those in the National Park (USDI, NPS, 1984a and 1984b). In a February 6, 1985 letter from the U.S. Secretary of the Interior to the Honorable John F. Seiberling, Chairman, Subcommittee on Public Lands and National Parks, Committee on Interior and Insular Affairs, a portion of the Lost Spring Canyon WSA was recommended as suitable for inclusion into the adjacent unit of the National Park System (U.S. Secretary of the Interior, 1985). No Congressional action has been taken on that recommendation.

The WSA is managed by BLM under the Grand RMP. The RMP has been reviewed by the Governor of the State of Utah and is consistent with State plans and policies. The RMP does not address potential wilderness designation for the WSA. Uses permitted in the RMP are identified under the No Action Alternative. They include grazing, mineral extraction, oil and gas exploration, utility corridor rights-of-way, and recreational uses including ORV activity. A natural gas pipeline right-of-way currently forms the northern boundary of the WSA.

The WSA lies entirely within Grand County. The *Grand County Master Plan* (University of Utah, Bureau of Community Development, 1979) does not favor wilderness but does recognize the value of "areas of critical environmental concern," after an area has been tested for mineral potential. The Plan generally emphasizes continuation of present uses and maximizing mineral development. The WSA is not specifically mentioned in the Plan. The Grand County Commission generally opposes designation of wilderness in the County.

Socioeconomics

DEMOGRAPHICS

The socioeconomic effects of designating or not designating the WSA as wilderness would be confined primarily to the Moab area. Grand County can be characterized as rural and sparsely populated. The 1982 county population was 8,100, less than 1 percent of the State population of about 1.5 million (Utah Office of Planning and Budget, 1984). The majority of the county is unpopulated, with 97 percent of the settlement concentrated in the Moab area. About 65 percent of the county's population lives in Moab which is approximately 24 road miles from the WSA.

About 80 percent of the county is owned by the Federal Government, 15.5 percent by the State, and 4.5 percent by private landowners.

EMPLOYMENT

Recent statistics show that 99 percent of local wage and salary employment is nonfarm, with about 17 percent employed in Federal, State, and local governments (refer to Table 6). Mining and tourism are the most important private industries in Grand County. Mining directly accounts for 25 percent of local employment; however, recent mining and milling layoffs may reduce mining's local importance. Tourism directly accounts for approximately 12 percent of local employment. The mining and tourist industries purchase some of their supplies locally, and those who work in these industries spend part of their income locally. This circulation of money from export industries contributes to local income and employment. Including these multiplier effects, mining and tourism account for 35 to 45 percent and 17 to 25 percent of local employment and income, respectively. Unemployment in the county is among the highest rates in the state with 1982 quarter figures of approximately 18 percent. This is due primarily to large mine layoffs and the resulting downturn through the local economy.

TABLE 6
1981 Income and Employment
Grand County, Utah

Industrial Sector	Income (Percent)	Employment (Percent)
Agriculture	1	Less than 1
Total Agriculture	1	Less than 1
Mining	34	25
Construction	7	5
Manufacturing	1	Less than 1
Transportation and Public Utilities	10	8
Finance, Insurance and Real Estate	3	2
Services	11	16
Other	-	-
Total Private Industry	85	82
Federal Government	5	6
State and Local Government	9	10
Total Government	14	17
Total Nonagricultural	99	99
Unemployment (1st Quarter, 1983)		18
	(Dollars)	(Jobs)
Total Employment and Income	$52,753	3,617
Total Personal Income	$75,404	

Sources: U.S. Department of Commerce, Bureau of Economic Analysis, 1983; Utah Department of Employment Security, 1983.

Note: Because of rounding, numbers are not additive. Total and percentage income figures include wage, salary, and proprietors' income. Employment percentage figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated. Tourism is included as part of Services, Retail Trade, and Other Services.

INCOME AND REVENUES

Economic-related activities in the WSA include mineral exploration, livestock production, and recreation. Table 7 summarizes local sales and Federal revenues from the WSA. Appendix 9 identifies the multipliers used to estimate income and revenues.

TABLE 7
Local Sales And Federal Revenues

Source	Annual Local Sales[1]	Annual Federal Revenues
Oil and Gas Leases	None	$11,640
Livestock Grazing	$8,380	$587
Recreational Use	Less than $3,075	None
Total	Less than $11,455	Up to $12,227

Sources: BLM File Data; Appendix 9.

[1]Local sales represent money potentially spent. They do not account for the total income that would be generated by these expenditures.

The WSA has no mining claims. The geophysical exploration that has been conducted in the WSA has generated some temporary local employment and income. No oil and gas or mineral production has occurred in the WSA. Therefore, mineral and energy resource production from the WSA has not contributed significantly to local employment or income.

One livestock operator has a total grazing privilege of 419 AUMs within the WSA. If all this forage were utilized, it would account for $8,380 of livestock sales and $2,095 of ranchers' returns to labor and investment.

No woodland products have been harvested from the WSA.

The WSA's nonmotorized recreational use and related local expenditures are low, well distributed, and insignificant to the local economy. The WSA's motorized recreational use and related local expenditures are low and insignificant. The actual amount of income generated locally from recreational use in the WSA is unknown. However, an approximate range of expenditures can be deduced from Dalton (1982). This study indicates that statewide average expenditures per noncommercial recreational visitor day for all types of recreation in Utah are approximately $4.10. The

noncommercial recreational use for Lost Spring Canyon WSA is estimated as about 750 visitor days per year. Only a portion of the expenditures for recreational use of the WSA contribute to the local economy of Grand County.

The WSA generates Federal revenues from mineral leases and livestock grazing fees (refer to Table 7).

Oil and gas leases in the WSA cover the entire 3,880 acres. At $3 per acre, lease rental fees generate up to $11,640 of Federal revenues annually. Half of these monies are allocated to the State, which then reallocates these revenues to various funds, the majority of which are related to energy development and mitigation of local impacts of energy and mineral development.

Average actual livestock use and, therefore, revenues generated from grazing in the WSA are unknown; however, the permittees in the WSA can use up to 419 AUMs per year. Based on a $1.40 per AUM grazing fee, the WSA can potentially generate $587 of grazing fee revenues annually, 50 percent of which would be allocated back to the local BLM district for the construction of rangeland improvements.

ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

Analysis Assumptions and Guidelines for all Alternatives

1. The alternatives would be carried out as noted in the Description of the Alternatives section.

2. Future users in the WSA would meet requirements for all applicable Federal, State, and local permits.

3. Designation of an area as wilderness would not result in impacts due to direct disturbance of resources. Any direct disturbance of resources under wilderness designation would result from use of prior rights that must be recognized by BLM. Such disturbance could occur with or without wilderness designation and is assumed to occur at one time.

4. The impacts of wilderness designation would result from (1) protection of certain resources; (2) denial of the opportunity to develop certain resources; or (3) restrictions placed on or changes in allowable management practices and land uses.

5. Estimates of in-place mineral resources are given based on a mineral resource evaluation of BLM WSAs by SAI (1982). These estimates were based on literature studies and known mining activities in the vicinity of the WSAs. The analysis presented in this section identifies the estimated amount of potentially recoverable mineral resources and then, using BLM's field experience and judgment, qualifies the probability of future development based on terrain, transportation, and economic factors. Appendix 6 records the methodology for estimation of potentially recoverable energy resources.

6. Once designated, management of an area as wilderness would continue in perpetuity.

No Action Alternative

The major changes that could occur in the area would be related to oil and gas and locatable mineral exploration and development. The area would be open to resource use and development without controls for wilderness protection. The degree of future development is unknown but would probably be low, and related to oil and gas. This is because the area has low overall mineral favorability, rough terrain, and unfavorable economics. The following is a worst-case analysis based on the assumption that minerals would be developed sometime in the future and would cause the following disturbance: oil and gas, 310 acres; potash, 420 acres; and uranium, 20 acres. (Appendix 10 lists mineral-related surface disturbance assumptions and estimates.)

AIR QUALITY

The WSA would continue to be managed by the State of Utah as a PSD Class II area. Disturbance of 750 acres would result in minor increases in fugitive dust emissions.

GEOLOGY

Little impact to geology is expected because surface disturbances associated with potash and oil and gas exploration and development activities would probably not exceed 750 acres. Much of the disturbance would probably occur largely in the form of roads and drill pads, which would not significantly alter the geological character of the affected area.

SOILS

It is estimated that up to 750 acres of soil could be

disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.51 cubic yard/acre/year. If disturbed, soil loss would increase to 4.15 cubic yards/acre/year. Soil loss on the 750 acres would increase from approximately 383 cubic yards/year to 3,113 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined. Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 2,730 cubic yards (137 percent) over the current annual soil loss of 1,998 cubic yards/year. The likelihood of this occurring is low because soils subject to severe or critical erosion tend to occur as pockets of fine sandy soil and could be avoided.

VEGETATION

The anticipated maximum of 750 acres disturbed could result in loss of as much as 30 percent of the area's sparse vegetation until reclamation is completed. No major changes in vegetation type would be expected. Reclamation efforts could possibly benefit vegetation growth in the long term.

Two BLM sensitive species, *Lomatium latilobum* and *Zigadenus vaginatus*, may occur within or near the WSA. Before authorizing surface-disturbing activities, BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken to protect these plants, if found, it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be preserved under the No Action Alternative.

WATER RESOURCES

Impacts to water interrelate closely to soils. Where surface disturbance occurs, increased sediment yield can affect water quality. Surface disturbance from mineral exploration and development could impact 750 acres under this alternative, with a soil loss increase of approximately 2,730 cubic yards/year (137 percent).

The loss in quality of surface and ground water resources would be significant if expected surface disturbance could not be mitigated to avoid a soil loss increase of this magnitude. Also, potash development has the potential for reducing ground water quality.

Opportunities for improvement or expansion of existing water sources could occur as allowed in the Grand RMP. No water developments are currently planned for the WSA.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

Under this alternative, oil and gas categorization in the WSA would remain Category 1 (standard stipulations).

The WSA is estimated to have 10 to 50 million barrels of oil and 60 to 300 billion cubic feet of natural gas in-place. Of this amount, 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas are considered recoverable. These oil and gas resources could be explored and developed without concern for wilderness values. Favorability for occurrence of oil and gas in the Mississippian Formation is seen as at least moderate for the WSA. However, due to the small size of the tract and its locations adjacent to Arches National Park, it is questionable whether development of oil and gas within the WSA will take place.

Potash

The entire WSA would be open to potash leasing and development. The potash-bearing zones under the WSA are estimated to be well below 7,000 feet. Although approximately 75,000 to 7.5 million tons of potash may be recoverable within the WSA, it is doubtful that potash at these depths in the Paradox Basin would ever be exploited, even by in-situ methods, because more favorable areas exist elsewhere in the Basin.

Locatable Minerals

Locatable mineral development could occur within the WSA without concern for wilderness values. The entire 3,880 acres would remain open to mining claim location. The potential deposit of less than 500 tons of uranium oxide and vanadium, less than 50,000 tons of copper, and less than 100,000 tons of manganese could be developed. Vanadium, copper, and manganese are all currently listed as strategic and critical minerals. The largest percentage of favorable mineral deposits occur beneath the surface of the WSA. It is unlikely that any of these minerals would be developed due to low resource potential. Rugged terrain characteristics of the WSA would increase the cost of subsurface exploration or development.

WILDLIFE

Wildlife could be adversely affected by possible habitat loss and disturbance from surface-disturbing activities (750 acres) and ORV use. Disturbance and habitat loss would be short term while work was ongoing, and habitat could be enhanced over the long term by reclamation and revegetation. More mobile wildlife species would leave the disturbed area during the period of activity. Less mobile species would probably remain at reduced population levels. There are no critical or crucial habitats that would be affected. No habitat improvement or wildlife transplants are planned for the area.

No threatened or endangered species are known to occur within the WSA. Still, potential habitat exists for the American peregrine falcon and the black-footed ferret (both endangered species). Also, the golden eagle, a BLM sensitive species, inhabits the area. Before authorizing surface-disturbing activities (750 acres potential) the BLM would conduct site-specific clearances of the potentially disturbed areas and informally consult with the FWS as required by BLM policy (refer to Appendix 4). If any threatened or endangered species could be affected, BLM would initiate formal Section 7 consultation with the FWS under provisions of the Endangered Species Act. Appropriate mitigating measures would be applied. Because necessary measures would be taken it can reasonably be concluded that the viability of populations of threatened, endangered, or sensitive species would be preserved with the No Action Alternative.

FOREST RESOURCES

The entire area would be open to woodland product harvest; however, there is no harvest of forest products at the present time, nor is any planned. Some juniper trees could be lost during the period of mineral development. However, no significant loss or harvest of forest resources would be anticipated.

LIVESTOCK

Domestic livestock grazing would continue as authorized in the Grand RMP. The 419 AUMs currently allocated in the WSA are controlled by one livestock permittee. Additional roads or other facilities for livestock handling could be proposed and developed in the future without regard for wilderness values. None are currently planned. The existing 0.25 mile of fence and the range trend monitoring transect could be maintained and accessed by mechanical methods. Motorized vehicles are currently used very little to manage livestock in the WSA and allowing their continued use would have little effect on livestock management. Overall, few if any changes in livestock management techniques are expected. Livestock forage could be temporarily reduced due to mineral and energy related disturbance. However, only about 5 percent of the AUMs in the Taylor grazing allotment are within the WSA, and the actual AUMs used are even less; therefore, the impact to livestock operations would be insignificant.

VISUAL RESOURCES

Under this alternative, visual quality in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., the entire 3,880 acres would be managed under VRM Class II objectives requiring that activities not be apparent).

However, under this alternative, 750 acres of mineral-related exploration and development are possible. Even though mitigative measures would be applied to minimize visual contrast created by intrusions, visual quality would be degraded in localized areas during the period of activity. VRM objectives would probably not be met in Class II areas during the short term. Even after rehabilitation, some permanent localized degradation would be expected. If 750 acres (19 percent of the WSA) were disturbed, visual quality could be significantly reduced in the WSA as a whole.

CULTURAL RESOURCES

Protection of cultural values would continue as currently provided. There is a potential for 750 acres of surface disturbance by mineral exploration and development under this alternative; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any surface disturbance. Inadvertent loss or damage could occur in the disturbed areas. The overall effect on cultural resources is unknown. There are no existing National Register sites within the WSA; however, some of the sites may have National Register potential.

RECREATION

Under this alternative the entire WSA would remain open for vehicular use in accordance with the BLM Grand RMP. Existing ways (0.25 mile) could continue to be used and new roads and ways could be developed.

Primitive recreation values would be foregone in those areas where potential mineral and energy surface-disturbing activities could take place (750 acres). However, overall recreational use of the WSA could be expected to increase as the State population increases. The amount of future

increase in recreational use of the WSA is unknown. However, based on a review of several projections (Utah Outdoor Recreation Agency, 1980; Utah Office of Planning and Budget, 1984; Jungst, 1978; and Hof and Kaiser, 1981) it is estimated that outdoor recreation in Utah will increase at about 2 percent per year over the next 20 years. At this rate overall recreational use is expected to increase from 750 current visitor days per year to 1,118 visitor days at the end of 20 years. Assuming that the 2-percent increase would be uniform among all recreation uses in the WSA, primitive recreational use would increase from the estimated current use of 550 visitor days per year to about 820 visitor days per year over the next 20 years. Likewise, recreational activities utilizing vehicular access (hunting, sightseeing, etc.) would increase from 200 visitor days per year to 298 visitor days.

WILDERNESS VALUES

None of the 3,880-acre area would be designated wilderness, and management would be under the Grand RMP. Under this alternative, wilderness values in the WSA would be protected by limitations placed on potential surface-disturbing activities (i.e., 3,880 acres would be managed under VRM Class II objectives requiring that activities not be apparent).

However, under this alternative, 750 acres of mineral exploration and development are possible. The related surface disturbance could result in a significant loss of the naturalness (3,880 acres), outstanding solitude (2,910 acres), and outstanding primitive and unconfined recreation opportunities (2,910 acres). Some of the area's special features (including excellent scenery and cultural values) could be disturbed or destroyed. Opportunities for solitude and primitive and unconfined recreation could be lost or reduced, not only due to surface disturbance, but also due to allowance of motorized uses. The likelihood of mineral development and related disturbance is low in this WSA.

LAND USE PLANS AND CONTROLS

This alternative would generally be consistent with the *Grand County Master Plan* because existing uses including mineral exploration would continue. The gas pipeline right-of-way that currently forms the northern boundary of the WSA could be moved or included within the WSA and other rights-of-way could be established as well. This alternative would be consistent with plans and policies of the State of Utah and would be in conformance with BLM's Grand RMP. The surface-disturbing activities potentially associated with this alternative would not be consistent with preservation of "scenic, scientific, cultural, and recreational values that importantly supplement or complement those within the current park boundary" (USDI, NPS 1984a); therefore, this alternative would not be consistent with the NPS recommendation to add the WSA to Arches National Park, nor with the proposed wilderness designation for 18,069 contiguous Park acres.

SOCIOECONOMICS

There would not be a loss of local employment or income as a result of this alternative. The existing ability to explore and develop mineral resources would remain as at present. If the oil and gas, uranium/vanadium, potash, copper, and manganese in the WSA were developed it would lead to a significant increase in employment and income for Grand County. However, the probability of mineral development is low (refer to the Mineral and Energy Resources section for a description of mineral and development potentials).

There would be no livestock-related economic losses because the potential grazing use (419 AUMs) and ability to maintain, replace, and build new range improvements would remain as at present.

As discussed in the Recreation section, recreational use and, therefore, recreation-related local expenditures, could increase at a rate of 2 percent per year over the next 20 years (49-percent increase over 20 years). Because recreational use in the area is estimated to increase over the next 20 years to 1,118 visitor days/year and overall recreation-related expenditures average $4.10 per visitor day for noncommercial use (only a portion of which contributes to the local economy), recreation-related expenditures attributable to the WSA (as much as $4,583) would likely not be significant to the local economy.

Federal revenues would not be reduced by this alternative. There are 3,880 acres in the WSA open to oil and gas leases that are currently leased. Leasing could continue on these acres and could provide up to $11,640 in Federal revenues annually. Half of these monies would be allocated to the State, a portion of which could reach the local economy. Collection of livestock grazing fees (currently approximately $587 per year) would continue.

All Wilderness Alternative (3,880 Acres) (Proposed Action)

Under this alternative, all 3,880 acres of the Lost Spring Canyon WSA would be designated by an act of Congress as part of the NWPS (refer to Map

2). This WSA is adjacent to Arches National Park and is contiguous with a 18,069-acre NPS-proposed wilderness. Because this WSA lacks the necessary size to constitute a wilderness area by itself, it can only be managed in part with the NPS-proposed wilderness. As a result, the Lost Spring Canyon WSA could be retained by BLM or transferred to the NPS, who would then assume management responsibilities. For this analysis it is assumed that BLM would retain management of the Lost Spring Canyon WSA. It would be managed in part with the contiguous NPS unit in accordance with the BLM "Wilderness Management Policy" to preserve its wilderness character. A specific Wilderness Management Plan would be developed to govern use and protection of the wilderness area.

As cited in the Description of the Alternatives section, major changes that could occur in the area would be related to its withdrawal from mineral location and closure to new mineral leasing and sale. The entire 3,880 acres would be placed in Category 4 (closed to leasing). The entire area would also be closed to ORV use, except for approvals by BLM. The WSA would be managed under VRM Class I which allows for only natural ecological change.

For the following analysis it is assumed that uranium mining claims would be filed prior to wilderness designation and would eventually be explored or developed, causing an estimated 20 acres of disturbance within the WSA. It is also assumed that existing oil and gas leases would expire before production of commercial quantities. Oil and gas leases would not be renewed and future leasing would not be allowed.

Because potentially disturbed areas would be smaller than under the No Action Alternative (20 vs. 750 acres), the impacts from development and surface disturbance on air quality, geology, livestock, wildlife, forest, and cultural resources under the All Wilderness Alternative would be insignificant. Wilderness designation would provide additional protection to these resources because it would reduce the potential for disturbance as compared to the No Action Alternative. Other effects on these resources due to changes in management are discussed below.

SOILS

The soil resource could benefit from the All Wilderness Alternative because of the reduced likelihood of surface-disturbing activities.

It is estimated that up to 20 acres of soil would be disturbed by mineral exploration and development. The average rate of soil loss at present is estimated to be about 0.51 cubic yard/acre/year. If disturbed, soil loss would increase to 4.15 cubic yards/acre/year. Soil loss on the 20 acres would increase from approximately 10 cubic yards/year to 83 cubic yards/year. Soil loss would decrease as reclamation occurred. However, the time required for complete reclamation cannot be determined. Therefore, under this alternative, maximum annual soil loss in the WSA would increase by approximately 73 cubic yards (3.7 percent) over the current annual soil loss of 1,998 cubic yards/year. This is 2,657 cubic yards/year less soil loss than could occur under the No Action Alternative.

VEGETATION

The anticipated maximum of 20 acres disturbed could result in loss of less than 1 percent of the area's sparse vegetation as compared to as much as 30-percent loss under the No Action Alternative. No major changes in vegetation type would be expected. This alternative would give added protection to the BLM sensitive species *Lomatium latilobum* and *Zigadenus vaginatus* because of reduction in potential surface disturbance.

WATER RESOURCES

Impacts to water interrelate closely to soils. Where surface disturbance occurs, increased sediment yield can affect surface water quality. Surface disturbance from mineral and energy exploration and development would impact as much as 20 acres under this alternative. It is expected that a 3.7-percent increase in soil loss could occur as compared to the 137-percent increase under the No Action Alternative. Because of the reduction in potential soil loss and because potash development with the potential for degrading ground water would not occur, the quality of both ground and surface water would not be significantly reduced under this alternative.

Under this alternative, opportunities for improvement or expansion of existing water sources could be limited to protect wilderness values. No improvements are currently planned.

MINERAL AND ENERGY RESOURCES

Leasable Minerals

Oil and Gas

The entire 3,880 acres are under pre-FLPMA oil and gas leases. No exploration or development of oil and gas is presently occurring within the WSA. Existing pre-FLPMA and post-FLPMA leases could be developed subject to the stipulations issued at the time of leasing. It is unlikely that existing leases will be developed or a showing of

commercial quantities made prior to their expiration dates, and expired leases will not be reissued.

The WSA is believed to be geologically favorable for the moderate occurrence of oil and gas, with an estimation of 3 to 15 million barrels of oil and 18 to 90 billion cubic feet of natural gas that could be recovered and would be foregone under this alternative.

Potash

Under this alternative, the area could not be leased for potash. It is assumed that there is 75,000 to 7.5 million tons of recoverable potash that could be foregone. However, the potash-bearing zones under the WSA are estimated to be well below 7,000 feet. It is doubtful that the potash resource at these depths would be explored or developed even without wilderness designation due to more favorable areas elsewhere.

Locatable Minerals

Development work, extraction, and patenting would be allowed to continue on valid claims after wilderness designation under unnecessary or undue degradation guidelines, with consideration given to protecting wilderness values. There are currently no claims in the WSA, but some could be filed prior to wilderness designation. If minerals are located prior to wilderness designation, it is estimated that up to 20 acres could be disturbed due to exploration and development of locatable mineral resources. The worst-case impact to minerals would occur if the potentially recoverable minerals are not within mining claims filed before designation. In that case, the potential for recovery of up to 50,000 tons of copper, 100,000 tons of manganese, and less than 500 tons of uranium oxide and vanadium could be foregone under this alternative. Vanadium, copper, and manganese are all currently listed as strategic and critical minerals. The largest percentage of favorable mineral deposits occur beneath the surface of the WSA. Rugged terrain characteristics of the WSA would increase the cost of subsurface exploration or development. It is unlikely that copper or manganese would be developed even without wilderness designation because of this and low resource potential.

WILDLIFE

Wildlife would benefit from the preservation of solitude and the reduction of surface-disturbing activities (750 acres to 20 acres) and from the ORV closure. Disturbance and habitat loss would be short term while work was ongoing, and habitat could be enhanced over the long term by reclamation and revegetation. Mobile animals would temporarily leave the area of disturbance and less mobile animals would remain under less viable conditions, but it is unlikely that any species would totally leave the area of the WSA with only 20 acres of surface disturbance. Threatened, endangered or sensitive species would be protected by appropriate mitigating measures as described for the No Action Alternative.

LIVESTOCK

Present domestic livestock grazing would continue as authorized in the Grand RMP. The 419 AUMs currently allocated in the WSA are controlled by one livestock permittee. The existing 0.25-mile pinyon pine fence and the range trend monitoring transect could be used and maintained in the same manner as the past, based on practical necessity and reasonableness. Vehicular access would probably not be allowed which would be somewhat inconvenient to the operator and BLM. New rangeland developments would be allowed on a case-by-case basis if necessary for resource protection (rangeland and/or wilderness) and the effective management of these resources, provided that wilderness protection standards are met. Development of livestock management facilities could be restricted to preserve wilderness values. However, no facilities are currently planned or likely to be planned for the area in the future.

VISUAL RESOURCES

Wilderness designation would contribute to the preservation of the area's visual resources. Under this alternative, the potential for surface-disturbing activities that could impair visual quality would be reduced through management under VRM Class I (which generally allows for only natural ecological change), through ORV closure, and through closure of the entire area to future mineral leasing and location.

Under this alternative the possible mineral-related disturbance would be reduced from 750 acres to 20 acres, associated with development of valid mining claims. Although mitigating measures would be applied to reduce visual contrast created by mineral-related surface disturbance, visual quality would be degraded and VRM Class I management objectives would not be met during the short term on disturbed areas. Even after rehabilitation, some permanent localized degradation could be expected. If roads for development of valid mining claims could not be denied (worst-case analysis), VRM Class I objectives might not be met on portions of the WSA. However, the potential for the visual quality to be reduced in the WSA as a whole is much less under this alternative than under the No Action Alternative.

CULTURAL RESOURCES

Approximately 20 acres could be disturbed by mineral exploration and development; however, inventories for the purposes of site recordation and mitigation of impacts would take place prior to any and all proposed surface disturbance and would mitigate any adverse impacts. Inadvertent loss or damage to cultural resources could occur, although these impacts are expected to be minimal.

There is potential for increased vandalism to cultural resources due to increased recreational use of the WSA. However, protection afforded by wilderness management would outweigh any potential vandalism problems caused by recreational activity, and the overall impact would be positive.

RECREATION

The WSA has outstanding primitive recreational values. If designated, those high-quality opportunities would be recognized, managed, and protected through the ORV closure, mineral leasing and location closure, and management under VRM Class I (which allows for only natural ecological change).

If roads for development of valid mining claims could not be denied, the quality of primitive recreational opportunities would be reduced. Because the potential mineral-related disturbance would be reduced under this alternative, the quality of the primitive recreational experience would likely be preserved.

The entire 3,880 acres, including existing vehicular ways, would be closed to recreational ORV use. These routes are used primarily for recreational access and use accounts for about 200 ORV visitor days/year. Similar nearby areas would continue to be available to ORV-type recreation; therefore, little impact on this type of use would be expected.

As discussed for the No Action Alternative, recreational use of the WSA is estimated to increase about 2 percent per year over the next 20 years in relation to population increases and current trends of recreational use. Publicity of the WSA that would likely follow wilderness designation would increase the public's awareness of both the WSA's and adjacent National Park's site characteristics. Designation could, therefore, lead to an undetermined increase in primitive nonmotorized recreational use above the baseline rate. Judging from use densities of a number of primitive areas, wilderness and proposed wilderness areas in the region; the WSA's site characteristics; the population distribution about the WSA; and the availability of similar sites, it is estimated that following designation primitive use could be as much as 776 visitor days/year (USDI, BLM, 1985). This is 26 visitor days (3.5 percent) over the area's current estimated 750 annual visitor days, and 226 visitor days over the existing primitive nonmotorized use. After this initial increase, use could continue to grow at the 2 percent per year growth rate discussed under the No Action Alternative.

Management provided through a Wilderness Management Plan would attempt to control destructive increases in future recreation use. The quality of the primitive recreation experience probably would not be negatively affected by the increased use.

It is concluded that primitive recreational type values would be enhanced through specific management and potential increases in recreational use would be controlled.

WILDERNESS VALUES

Wilderness designation would contribute to the preservation of the area's wilderness characteristics including 3,880 acres considered natural, and 2,910 acres with outstanding opportunities for solitude and primitive and unconfined recreation. The special scenic and cultural features would also be protected. Under this alternative, the potential for surface-disturbing activities that could impair wilderness values would be reduced through management under VRM Class I (generally allowing for only natural ecological change), ORV closure, and closure of the entire area to future mineral leasing and location.

No development of leases is foreseen under this alternative. The possible mineral-related surface disturbance would, therefore, be reduced from 750 acres to 20 acres for development of valid mining claims should any be filed prior to wilderness designation. Mitigation to protect wilderness values would be considered during mining claim development, but road construction and use of motorized equipment could be allowed if there were no reasonable alternatives.

None of the WSA is currently under mining claim. Naturalness, solitude, and primitive and unconfined recreation opportunities on the affected areas could be lost or at least reduced until satisfactory reclamation was conducted. However, because possible mineral-related development would be reduced under this alternative and mitigation would be imposed to protect wilderness values, loss of wilderness values in the area as a whole would be much less likely under this alternative than if the area is not designated as wilderness.

A State section (640 acres) within Arches National Park would be isolated if the WSA is designated wilderness. Access to the State section must be allowed and, unless the NPS acquires the section through purchase, some problems with protecting the area's wilderness values from State section development including development of access could result.

LAND USE PLANS AND CONTROLS

Wilderness designation would not be consistent with the *Grand County Master Plan* of maximizing mineral development nor with the policies of the Grand County Commission. It would not, however, totally conflict with the Plan's multiple-use concept since many existing uses would continue, although under more restrictive conditions. Designation could prevent alteration of the existing natural gas pipeline right-of-way that forms the northern boundary of the WSA if that became necessary. The BLM Grand RMP does not provide for wilderness designation. A decision by Congress to designate the WSA as wilderness would be an amendment to the RMP. One (640 acres) of the three State sections that border the WSA would be isolated by BLM wilderness and NPS lands if the area is designated wilderness. This section is within Arches National Park. Development of the section by the State could become more difficult due to access problems, but could not be curtailed. Unless the State section is purchased by the NPS, the wilderness designation could thus conflict somewhat with the policy of the State of Utah to maximize economic returns.

Wilderness designation would protect the values in Lost Spring Canyon identified by the NPS. It is noted that the NPS recommendation (based on H.R. 1214) does not propose adding these lands to the National Park System as wilderness but would place the WSA within the Park boundary. The wilderness management objective of the All Wilderness Alternative would be similar in many respects to NPS land use planning objectives. A BLM-managed wilderness area in Lost Spring Canyon would be consistent with and complement the NPS management of the adjacent Arches National Park proposed wilderness.

SOCIOECONOMICS

Overall there would not be significant changes in current trends of population, employment, or local income distribution.

Because of restrictions placed on the use of resources under wilderness designation there could be slight losses in local income and Federal revenues currently provided by resource uses in the WSA (refer to Table 7) as well as loss of potential increases in income and Federal revenues that could occur under the No Action Alternative.

The probability of mineral development in the WSA is low (refer to the Mineral and Energy Resources section for a discussion of the WSA's mineral character). Valid existing oil and gas leases and mining claims could be developed but designation would preclude new leases and claims from being established in the WSA. Precluding exploration and development of minerals would not alter existing economic conditions, but could alter future economic conditions from what they would be with mineral development under the No Action Alternative. Because the probability of mineral development in the WSA is low, it is estimated that potential mineral-related local income would not be significantly reduced by wilderness designation. However, any local income related to assessment of future mining claims would be lost.

Livestock use and ranchers' income would continue as at present with $8,380 of livestock sales and $2,095 of ranchers' return to labor and investment. No potential range improvements have been proposed that would result in increased ranchers' income.

Increased public awareness of the area resulting from designation could increase nonmotorized recreational use (refer to the Recreation section). Related local expenditures would average $4.10 per visitor day for noncommercial use (776 visitor days), and would probably be insignificant to the local economy. Motorized recreational use of the WSA is light (200 visitor days per year). The decrease in related local expenditures due to closure of the WSA to ORVs would be small and insignificant to both the local economy and individual businesses.

The loss of leases on 3,880 acres currently leased would cause an eventual loss of up to $11,640 per year of lease fees to the Federal Treasury. In addition to these rental fees, any potential royalties from new lease production could also be foregone.

Recreation-related Federal revenues could increase if the demand for commercial outfitter services increases with designation. Currently there is no commercial recreational use in the WSA.

Federal revenues from livestock grazing would continue as with the No Action Alternative.

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